

Conceptual

# Fire Protection Plan

For  
Otay Business Park  
East Otay Mesa  
APN# 648-070-21  
TM# 5505



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by*

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## **1. Introduction/Project Description:**

This is the Conceptual Fire Protection Plan for a 59-lot commercial/industrial development on 161.6 acres north of the Mexican border in East Otay Mesa. The TM would divide the 161.6 acres into 59 commercial/industrial lots on 120.3 acres. Lot sizes will range from 0.9 acres to 5.0 acres. It is located on an extension at the South end of Alta Road, and east of an extension of Airway and east of Siempre Viva. Siempre Viva and Airway will extend through the project. The South side of the property adjoins the border. The development is called the Otay Business Park. The development is located in the Rural Fire Protection District (RFPD). The exact uses on each lot have not been identified as yet, but they will be industrial uses complying with the County Zoning requirements and Subarea 11 of the East Otay Mesa Specific Plan. No buildings have been designed as yet. Therefore, the scope of this conceptual plan is to provide a fire risk assessment, set forth some of the potential requirements, which would be imposed when each lot is developed, and to recommend standards that should be followed when detailed design is done on various lots. Focused Fire Protection Plans and submittals will be required for any new development on any lot at time of development of such parcel. Actual requirements of the Fire District and DPLU Fire Marshal may vary from the requirements and recommendations in this conceptual plan at time of submittal of detailed plans for development on individual lots. "Recommendations" in this plan shall be changed to mandatory "shall" language in those subsequent Fire Protection Plan submittals per the DPLU County Fire Marshal.

This development is within the East Otay Mesa Specific Plan area. The TPM is TM 5505. The Assessors Parcel # is 648-070-21. The Environmental Log number is 93-19-006 AA.

The Thomas Guide Page # is 1332-D-3. Site address is 799 Alta Road.

This development is proposed to be for mixed industrial uses. The plan is to construct up to 2,096,107 square feet of Business Park use consisting of warehousing, manufacturing, assembly, storage, science research and development, and commercial facilities. The manufacturing and storage of explosives, storage of toxic waste, and animal rendering plants are prohibited by the Specific Plan. Some of the potential uses may include, but are not limited to:

- R and D facilities
- Warehousing
- High piled stock warehouses
- Recycling facilities
- Custom manufacturing
- Fabrication
- Compounding
- Processing
- General industrial
- Mini warehouses
- Agricultural uses
- Winery

Most uses will probably be high piled stock warehousing and truck transfer due to proximity to the border. Such facilities will commonly have the highest sprinkler demand due to Group A Plastics. However, in concept, the estimated worst-case sprinkler and hose stream demand may be 3530 GPM for a Hazardous Materials H room with in rack heads.

The site is accessed by the following existing roads: Alta Road on the north and Airway and Siempre Viva on the west. Secondary access is adequate.

When they are designed, the site layout within each lot, on site access roads, water supply, fire sprinklers, structures and operations therein shall comply with the Rural Fire Protection District Fire Code, the County Fire Code, the requirements of the County Department of Planning and Land Use Fire Marshal, the County Building Code, and appropriate National Fire Protection Association Standards including, but not limited to:

- #10 (Extinguishers)
- #13 (Fire Sprinklers)
- #15 (Water Spray Systems)
- #20 (Fire Pump Systems)
- #22 (Private Fire Service Water Storage Tanks)
- #24 (Private Fire Water Systems)
- #850 (Power Plants)
- #72 (Fire Alarms)

etc., as applicable to the proposed occupancies, at time of submittal of plans for development on any lot. Other 2007 Codes that will apply are as follows:

- District and County Fire Code including, but not limited to Chapter 34; Flammable and combustible liquids, Chapter 27; Hazardous Materials, and Chapter 23; High Piled Stock.
- County Building Code, including all requirements for building size based on type of construction and occupancy type, and all requirements for H occupancies.

Focused Fire Protection Plans and submittals will be required for the developments on each lot at that time.

Such plans for any lot shall reference and include the recommendations and standards in this plan, as modified to address the actual proposed development, and shall address compliance with the RFPD Fire Code and the County DPLU Fire and Building Code. At this point it is not known what type of occupancies would be constructed, however, it is understood that the uses will all be industrial (manufacturing or warehouses, etc.) and not residential or institutional.



## **2. Risk Assessment:**

### **A. Vegetation Threat:**

The site is mostly flat. The parcel is vacant. It is former farmland just north of the border. It is mostly dry grass which is about 3' high, approximately 3 tons per acre, and which would be a BEHAVE Model #3. There are some hills to the north and northeast, but off the property and beyond some flat land. Refer to photos in the Appendix of this plan.

It must be noted that the developer of the private lots will have no control over the type of street tree, or other offsite vegetation, which may be required by the County. The developer has control over what is planted onsite, as long as it meets County requirements. The County should assure that any vegetation that it requires to be planted on streets and other offsite locations, including trees, are fire safe, properly spaced and properly maintained. No vegetation found on the prohibited plant list in Section 4 of this plan should be planted, or remain, in those areas.

The consultant inspected the site on 7-31-06.

The vegetation on and surrounding the parcels, was observed to be mainly tall dry grass. The site reflects evidence of frequent fires. A 40,000 plus acre fire, "the Otay fire", occurred in the area on 10-26-03, one day after the Cedar Fire. There is evidence of a recent fire on a hill near the site. The Fire Chief states that illegal immigrants crossing the border tend to set fires as they move through the area.

The vegetation fire threat to the site, from offsite vegetation, is relatively low. The only estimated threat, assuming proper perimeter 100' fuel modification zones are provided from structures (zones can include roads), would be from spotting in a wind driven fire, such as a fire starting in Mexico, which could result in airborne burning debris landing in onsite vegetation, on roofs, or entering vents or HVAC systems. Smoke could be entrained into buildings through open doors, smoke vents, or air conditioning system intakes.

Future development in this industrial park will result in all, or a significant amount, of the existing vegetation being removed and replaced by buildings, roads and landscaped areas.

An estimate of the potential fire behavior from the offsite vegetation is as follows, based on models run, by Scott Franklin, of Scott Franklin Consulting. Models provide estimates only. Actual fire behavior can be more or less intensive. Models must only be used by those trained in their use and who have a wildland firefighting background.

The following inputs can be used to replicate a summer fire, the Otay Fire (one day after Cedar Fire), and a fall fire in 3' grass. No current RAWS data was available. Temperatures are from the National Weather Service in Chula Vista, and as observed on site.

**INPUTS:**

| <b>Summer Fire</b>       | <b>Otay Fire</b>         | <b>Fall Fire; High Wind</b> |
|--------------------------|--------------------------|-----------------------------|
| 1 hour fuel moisture: 3% | 1 hour fuel moisture: 2% | 1 hour fuel moisture; 2%    |
| 20 ft wind speed; 20 mph | 20' wind speed: 14 mph   | 20 ft wind: 50 MPH          |
| Air temp. 95 degrees f   | Air temp: 88 degrees F   | Air temp: 88 degrees F      |
| Slope: 0                 | Slope: 0                 | Slope: 0                    |

**Outputs of Model: FM 3; 3' High Grass**

| <b>Summer Fire; 95 degrees/<br/>20 mph wind</b> | <b>Otay Fire</b>             | <b>Fall Fire; High Wind</b>  |
|---|------------------------------|------------------------------|
| Rate of spread; 2.5 mph                         | Rate of spread: 1.8 mph      | Rate of spread: 9 mph        |
| Flame length: 19'                               | Flame length: 16.8'          | Flame length: 36'            |
| Spotting distance: 0.7 miles                    | Spotting distance: 0.5 miles | Spotting distance: 2.1 miles |

The vegetation fire threat is not a severe or catastrophic threat. Worst-case fire is the fall fire with a high wind flame lengths of 36'. The site, after development, should not present a catastrophic wildland fire threat.



### **3. Vegetation Management (Fuel Modification) Zones:**

Based upon the Vegetation Fire Risk Assessment done for this plan, Fuel Modification Zones will be required around all structures, and on roadsides, in compliance with the District and County Fire Codes. State law, County Fire Code and the Fire District require at least 100' fuel modification from buildings. Therefore, Fuel Modification should be provided for a distance of 100' around all structures (or up to an adjoining structure if less than 100').

#### **Fuel Modification Zones:**

Any areas within the 100' from any portion of a structure, which have vegetation in them, should be as follows:

##### **Zone A; Defensible Space;Irrigated wet zone 50' on all sides of all structures:**

This defensible space is an irrigated, maintained, wet zone. No flammable or combustible growth. No dead or dying vegetation. No dry grass. Grasses and ground cover to be low profile, less than 4". There should be no vegetation within 10' of any building or chimney, exhaust vent or exhaust stack. No tree canopies within 10' of structures. Trees to be 20' between mature canopies. Examples of a tree allowed beyond 10' is a well spaced and maintained specimen of Coastal Live Oak, sycamore, maple, elm, cottonwood, willow or jacaranda, if determined to be suitable for the area by a landscape architect. The first 50' from the structure shall consist of well irrigated, well spaced, Fire District approved, low fuel volume, high leaf moisture, drought tolerant, low profile fire resistive groundcover or lawn. Fire resistive shrubs, bedding plants and flowers, may be planted, to a height of 18". Spacing between mature shrubs, and between mature plants, should be 2 times height on slopes less than 20% (minimum 3' apart), 4 times height on slopes 21-40%, and 6 times height on slopes over 40%. Shrubs and plants shall be located away from tree drip lines. No flammable under story allowed under trees. Any fire resistive vegetation under trees should be low growing and mature height to be 1/3 height of the lowest portion of the limbs and branches, or 18" max whichever is less, in order to prevent any fire laddering.

Any specimen of approved trees or shrubs must be properly located, spaced, limbed and pruned to a height of 1/3 the height or 6' from the ground, whichever is greater.

No dry grasses, acacia, eucalyptus, palm, juniper, cypress, conifer, olive, pepper, camphor, cedar, bottlebrush, pampas grass, chaparral, sage including purple sage, coastal sage scrub, sagebrush, salvia spp, chamise, California buckwheat or manzanita. See additional prohibited vegetation in the "Prohibited Plant List" in Section 4 of this plan. The objective is to prevent spread of fire to or from a structure. It is extremely critical to keep flammable vegetation and ornamental vegetation away from the structure so as to prevent a path for fire to reach the structure. No chipped biomass or wood bark within 30' of structures. No vegetation allowed on any trellises.

No firewood or LPG tanks within 30' of a structure (except for a small portable barbeque or patio heater 10' or more from structure). No flammable vegetation allowed under or around LPG tanks for 30'. The Fire District requirement is 10'.



**Zone B (from 51' beyond structure to a minimum of 100' from all sides of structure):**

This Zone may or may not be an irrigated wet zone. No dead grass. If vegetation or trees are planted, irrigation may be needed. Zone to be limited to low fuel volume, high leaf moisture, fire resistive, drought tolerant, low profile fuel (native grasses or groundcover less than 4") and fire resistive shrubs and trees. No dead or dying vegetation is allowed. No dry grass. Trees must be properly limbed up (1/3 height or 6' whichever is greater), dead fuels removed, flammable under story removed. Fire resistive shrubs or plants may be under trees but must be limited to same height as in Zone A. Specimens of approved and properly maintained trees such as coastal live oak, sycamore, maple, elm, cottonwood, willow, jacaranda or other high leaf moisture/low oil content trees may be used if deemed suitable for this area by a landscape architect. Trees to be 20' between mature canopies. No acacia, eucalyptus, palm, juniper, pepper, olive, bottlebrush, cypress, conifer, cedar or pampas grass. No chaparral, sage, including purple sage, chamise, salvia spp, coastal sage scrub, sagebrush, California buckwheat, or manzanita. All exotics shall be removed. See additional list of prohibited vegetation in the "Prohibited Plant List" in Section 4 of this plan. Approved fire resistive shrubs and plants may be used if kept below 3', spaced the same as for Zone A, and kept free of all dead fuel.

Proper erosion control and soil stability provisions are needed in each zone. An adequate amount of vegetation is needed to prevent erosion and to protect slopes.

**B. Roadside Fuel Modification:**

There shall be Fuel Modification Zones on each side of any onsite and public roadsides throughout the development. Fuel Modification Zones are required be 30' wide on each side of any new driveway or roadway, and 20' each side of any existing roadway per the County Fire Code. The zone may be a landscaped, irrigated wet zone, utilizing fire resistive vegetation. Ground cover to be 4" or less. Any shrubs to be 2' or less. There shall be no flammable vegetation or flammable trees in the roadside, or center median, fuel modification zones or landscaped areas. Any trees shall be fire resistive and shall not be of a type prohibited in this plan. They should be spaced 30' between canopies. Trees to be limbed up 1/3 height or 6' whichever is greater. There shall not be closed canopies over public roads. Onsite roads to be clear to the sky. Any trees shall be planted 10' from edge of road to center of tree trunk. They will be maintained in compliance with this plan, by the Landscape Maintenance District (LMD) or other County approved legal entity, or an owners association or maintained by the property managers. Responsibility for the maintenance shall be included in a legal document to approval of County DPLU such as a contract with tenant, CC&R's or deed encumbrances. The property owner shall assure that proper roadside vegetation is done on an ongoing basis. No vegetation prohibited in this plan shall be planted in this area. Erosion control and soil stability must be provided. Note: The owners of the parcels have no control over what the County plants, or requires to be planted, on public roads.



**Open space and sensitive Biological Preserve area under control of the Resource Agencies and the County:**

Fuel modification may not be allowed in any sensitive biological preserve, wetland buffers, vernal pools, etc and permission is required from the resource agencies in order to do any fuel modification in those areas.

**Power lines:**

All new power lines shall be underground.

**LPG Tanks:**

30' of clearance of native vegetation, weeds and brush shall be provided under and around LPG tanks. RFPD Fire Code requires 10'.

**Water Detention Basins:**

Any water retention basins and any aboveground drainage channels must be kept clear of any flammable vegetation on an annual and ongoing basis.

**General Comments:**

Fuel Modification may consist of mowing or otherwise cutting or removing flammable vegetation or may consist of properly spaced and installed, approved, irrigated, and maintained, drought tolerant, fire resistive landscaping. No vegetation from the Prohibited Plant List in Section 4 of this plan should be planted or remain. The focused Fire Protection plans for each new development on the parcels shall set forth the size and configuration of the required fuel modification zones around buildings and roads. The plan shall also describe in detail the spacing and height of vegetation in the zones, including trees. The building owners shall be responsible to maintain the vegetation fire safe on an ongoing basis.

There will be street trees and vegetation planted, irrigated and maintained by the County.

The developer will have no control over the type of vegetation the County may require as planting in the offsite areas and streets. There are also some areas onsite, which would be landscaped, irrigated and maintained by the developer. It is important to not plant vegetation that could catch fire from airborne burning debris coming from an offsite fire. This is called "spotting". Palm trees, Eucalyptus, and certain other trees are susceptible to this. If the County mandates such trees, they must be properly maintained and irrigated with no flammable understory. The following list of prohibited plants should be followed where possible.

#### 4. Prohibited Plant List:

Certain vegetation is considered to be undesirable in the landscape due to characteristics that make them highly flammable. These characteristics can be physical or chemical. Physical properties that contribute to high flammability include large amounts of dead material retained within the vegetation, rough or peeling bark, and the production of large amounts of litter. Chemical properties include presence of oils, resins, wax, and pitch. Any such existing vegetation should be removed and new ones should not be introduced.

| Botanical Name   | Common Name  | Comment* |
|--|--|----------|
| <b>Trees</b>   |  |          |
| <i>Abies species</i>   | Fir  | F        |
| <i>Acacia species (numerous)</i>   | Acacia   | F, I     |
| <i>Agonis juniperina</i>   | Juniper Myrtle   | F        |
| <i>Araucaria species (A. heterophylla, A. araucana, A. bidwillii)</i>      | Araucaria (Norfolk Island Pine, Monkey Puzzle Tree, Bunya Bunya) | F        |
| <i>Callistemon species (C. citrinus, C. rosea, C. viminalis)</i>           | Bottlebrush (Lemon, Rose, Weeping)                               | F        |
| <i>Calocedrus decurrens</i>  | Incense Cedar  | F        |
| <i>Casuarina cunninghamiana</i>  | River She-Oak  | F        |
| <i>Cedrus species (C. atlantica, C. deodara)</i>                           | Cedar (Atlas, Deodar)  | F        |
| <i>Chamaecyparis species (numerous)</i>                                    | False Cypress  | F        |
| <i>Cinnamomum camphora</i>   | Camphor  | F        |
| <i>Cryptomeria japonica</i>  | Japanese Cryptomeria   | F        |
| <i>Cupressocyparis leylandii</i>   | Leyland Cypress  | F        |
| <i>Cupressus species (C. fobesii, C. glabra, C. sempervirens,)</i>         | Cypress (Tecate, Arizona, Italian, others)                       | F        |
| <i>Eucalyptus species (numerous)</i>                                       | Eucalyptus   | F, I     |
| <i>Juniperus species (numerous)</i>  | Juniper  | F        |
| <i>Larix species (L. decidua, L. occidentalis, L. kaempferi)</i>           | Larch (European, Japanese, Western)                              | F        |
| <i>Leptospermum species (L. laevigatum, L. petersonii)</i>                 | Tea Tree (Australian, Tea)                                       | F        |
| <i>Lithocarpus densiflorus</i>   | Tan Oak  | F        |
| <i>Melaleuca species (M. linariifolia, M. nesophila, M. quinquenervia)</i> | Melaleuca (Flaxleaf, Pink, Cajeput Tree)                         | F, I     |
| <i>Olea europea</i>  | Olive  | I        |



| Botanical Name  | Common Name  | Comment* |
|---|--|----------|
| <i>Picea</i> (numerous)   | Spruce   | F        |
| <i>Palm species</i> (numerous)  | Palm   | F, I     |
| <i>Pinus species</i> ( <i>P. brutia</i> , <i>P. canariensis</i> , <i>P. b. eldarica</i> , <i>P. halepensis</i> , <i>P. pinea</i> , <i>P. radiata</i> , numerous others)                       | Pine (Calabrian, Canary Island, Mondell, Aleppo, Italian Stone, Monterey)            | F        |
| <i>Platycladus orientalis</i>   | Oriental arborvitae  | F        |
| <i>Podocarpus species</i> ( <i>P. gracilior</i> , <i>P. macrophyllus</i> , <i>P. latifolius</i> )   | Fern Pine (Fern, Yew, Podocarpus)  | F        |
| <i>Pseudotsuga menziesii</i>  | Douglas Fir  | F        |
| <i>Schinus species</i> ( <i>S. molle</i> , <i>S. terebenthifolius</i> )   | Pepper (California and Brazilian)  | F, I     |
| <i>Tamarix species</i> ( <i>T. africana</i> , <i>T. aphylla</i> , <i>T. chinensis</i> , <i>T. parviflora</i> )  | Tamarix (Tamarisk, Athel Tree, Salt Cedar, Tamarisk)                                 | F, I     |
| <i>Taxodium species</i> ( <i>T. ascendens</i> , <i>T. distichum</i> , <i>T. mucronatum</i> )  | Cypress (Pond, Bald, Monarch, Montezuma)   | F        |
| <i>Taxus species</i> ( <i>T. baccata</i> , <i>T. brevifolia</i> , <i>T. cuspidata</i> )   | Yew (English, Western, Japanese)   | F        |
| <i>Thuja species</i> ( <i>T. occidentalis</i> , <i>T. plicata</i> )   | Arborvitae/Red Cedar   | F        |
| <i>Tsuga species</i> ( <i>T. heterophylla</i> , <i>T. mertensiana</i> )   | Hemlock (Western, Mountain)  | F        |
| <b>Groundcovers, Shrubs &amp; Vines</b>   |  |          |
| <i>Acacia species</i>   | Acacia   | F, I     |
| <i>Adenostoma fasciculatum</i>  | Chamise  | F        |
| <i>Adenostoma sparsifolium</i>  | Red Shanks   | F        |
| <i>Agropyron repens</i>   | Quackgrass   | F, I     |
| <i>Anthemis cotula</i>  | Mayweed  | F, I     |
| <i>Arbutus menziesii</i>  | Madrone  | F        |
| <i>Arctostaphylos species</i>   | Manzanita  | F        |
| <i>Arundo donax</i>   | Giant Reed   | F, I     |
| <i>Artemisia species</i> ( <i>A. abrotanum</i> , <i>A. absinthium</i> , <i>A. californica</i> , <i>A. caucasica</i> , <i>A. dracunculus</i> , <i>A. tridentata</i> , <i>A. pycnocephala</i> ) | Sagebrush (Southernwood, Wormwood, California, Silver, True tarragon, Big, Sandhill) | F        |
| <i>Atriplex species</i> (numerous)  | Saltbush   | F, I     |
| <i>Avena fatua</i>  | Wild Oat   | F        |
| <i>Baccharis pilularis</i>  | Coyote Bush  | F        |
| <i>Bambusa species</i>  | Bamboo   | F, I     |
| <i>Bougainvillea species</i>  | Bougainvillea  | F, I     |

| Botanical Name   | Common Name                                | Comment* |
|--|--|----------|
| <i>Brassica species (B. campestris, B. nigra, B. rapa)</i> | Mustard (Field, Black, Yellow)             | F, I     |
| <i>Bromus rubens</i>                                       | Foxtail, Red brome                         | F, I     |
| <i>Castanopsis chrysophylla</i>                            | Giant Chinquapin                           | F        |
| <i>Cardaria draba</i>                                      | Hoary Cress                                | I        |
| <i>Carpobrotus species</i>                                 | Ice Plant, Hottentot Fig                   | I        |
| <i>Cirsium vulgare</i>                                     | Wild Artichoke                             | F, I     |
| <i>Conyza bonariensis</i>                                  | Horseweed                                  | F        |
| <i>Coprosma pumila</i>                                     | Prostrate Coprosma                         | F        |
| <i>Cortaderia selloana</i>                                 | Pampas Grass                               | F, I     |
| <i>Cytisus scoparius</i>                                   | Scotch Broom                               | F, I     |
| <i>Dodonaea viscosa</i>                                    | Hopseed Bush                               | F        |
| <i>Eriodictyon californicum</i>                            | Yerba Santa                                | F        |
| <i>Eriogonum species (E. fasciculatum)</i>                 | Buckwheat (California)                     | F        |
| <i>Fremontodendron species</i>                             | Flannel Bush                               | F        |
| <i>Hedera species (H. canariensis, H. helix)</i>           | Ivy (Algerian, English)                    | I        |
| <i>Heterotheca grandiflora</i>                             | Telegraph Plant                            | F        |
| <i>Hordeum leporinum</i>                                   | Wild barley                                | F, I     |
| <i>Juniperus species</i>                                   | Juniper                                    | F        |
| <i>Lactuca serriola</i>                                    | Prickly Lettuce                            | I        |
| <i>Larix species (numerous)</i>                            | Larch                                      | F        |
| <i>Larrea tridentata</i>                                   | Creosote bush                              | F        |
| <i>Lolium multiflorum</i>                                  | Ryegrass                                   | F, I     |
| <i>Lonicera japonica</i>                                   | Japanese Honeysuckle                       | F        |
| <i>Mahonia species</i>                                     | Mahonia                                    | F        |
| <i>Mimulus aurantiacus</i>                                 | Sticky Monkeyflower                        | F        |
| <i>Miscanthus species</i>                                  | Eulalie Grass                              | F        |
| <i>Muhlenbergia species</i>                                | Deer Grass                                 | F        |
| <i>Nicotiana species (N. bigelovii, N. glauca)</i>         | Tobacco (Indian, Tree)                     | F, I     |
| <i>Pennisetum setaceum</i>                                 | Fountain Grass                             | F, I     |
| <i>Perovskia atroplicifolia</i>                            | Russian Sage                               | F        |
| <i>Phoradendron species</i>                                | Mistletoe                                  | F        |
| <i>Pickeringia montana</i>                                 | Chaparral Pea                              | F        |
| <i>Rhus (R. diversiloba, R. laurina, R. lentii)</i>        | Sumac (Poison oak, Laurel, Pink Flowering) | F        |
| <i>Ricinus communis</i>                                    | Castor Bean                                | F, I     |
| <i>Rhus Lentii</i>   | Pink Flowering Sumac                       | F        |



| Botanical Name                   | Common Name               | Comment* |
|----------------------------------|---------------------------|----------|
| <i>Rosmarinus species</i>        | Rosemary                  | F        |
| <i>Salvia species (numerous)</i> | Sage                      | F, I     |
| <i>Salsola australis</i>         | Russian Thistle           | F, I     |
| <i>Solanum Xantii</i>            | Purple Nightshade (toxic) | I        |
| <i>Silybum marianum</i>          | Milk Thistle              | F, I     |
| <i>Thuja species</i>             | Arborvitae                | F        |
| <i>Urtica urens</i>              | Burning Nettle            | F        |
| <i>Vinca major</i>               | Periwinkle                | I        |

\*F = flammable, I = Invasive

**NOTES:**

1. Plants on this list that are considered invasive are a partial list of commonly found plants. There are many other plants considered invasive that should not be planted in a fuel modification zone and they can be found on The California Invasive Plant Council's Website [www.cal-ipc.org/ip/inventory/index.php](http://www.cal-ipc.org/ip/inventory/index.php). Other plants not considered invasive at this time may be determined to be invasive after further study.
2. For the purpose of using this list as a guide in selecting plant material, it is stipulated that all plant material will burn under various conditions.
3. The absence of a particular plant, shrub, groundcover, or tree, from this list does not necessarily mean it is fire resistive.
4. All vegetation used in Vegetation Management Zones and elsewhere shall be subject to approval of the Fire Marshal.
5. Landscape architects may submit proposals for use of certain vegetation on a project specific basis. They shall also submit justifications as to the fire resistivity of the proposed vegetation.
6. This list was prepared by Hunt Research Corporation and Dudek and associates and reviewed by, Scott Franklin Consulting co.

**Notes:**

DO NOT PLANT, OR RETAIN, ANY OF THE ABOVE LISTED VEGETATION IN ANY VEGETATION MANAGEMENT ZONE, LANDSCAPED AREA, OR IN ANY MEDIAN OR PLANTER ON ANY PARCEL. ANY OF THE ABOVE LISTED TREES OR SHRUBS SHOULD NOT BE USED AS STREET TREES. OR SHRUBS. This list is not all-inclusive as lessons are learned regarding fire resistance during every fire. Also, other plants and trees can become fire hazards under drought conditions or due to lack of maintenance and irrigation. Landscape architects may submit a report to the Fire Marshal with written justification and certification as to the fire resistiveness of certain plants, for review of the Fire Marshal.

**Maintenance:**

Ongoing maintenance and irrigation is necessary so that onsite vegetation will not be ignited. This includes weeding, pruning, limbing, and irrigation. Vegetation management must be done at least annually, before May 1, and more often as needed to maintain fire safety. It is anticipated that this development will have regular landscaping service. Trees should be limbed up 1/3 their height, or 6', spaced 20' between canopies, and should not have any flammable, non-fire resistive, vegetation under them. Any fire resistive shrubs under them that should not be over 1/3 the height of the lowest branch or limb of the tree. Any shrubs or other understory must be fire resistive. There should not be any tree limbs or canopies within 10' of a building. Any grass should be kept to 4" and irrigated. There must be no flammable vegetation, dead grass or weeds.

There shall be no vegetation or trees that obstruct Fire Department operations, including access, raising of ladders, or use of fire hydrants and Fire Department connections. Onsite access roads should be kept clear to the sky with no overhanging canopies.

Some general recommendations are provided in the following sections beginning on the following page.



## **5. Planting, Spacing and Maintenance Guidelines:**

### General Information Regarding Vegetation Management:

- A. Maintenance includes irrigation and regular, ongoing (annual and more often as needed) removal of weeds, dead materials, and other undesirable flammable vegetation required to keep the area fire safe.
- B. As new plantings mature, they must be thinned to maintain the recommended spacing and heights.
- C. The terms “fire wise”, “fire resistant” or “fire retardant” are misleading. All vegetation and plants will burn if exposed to enough heat. Because something is considered fire retardant or fire resistant does not mean that unlimited quantities can be planted or that they will somehow slow down a fire.
- D. Limit or eliminate use of plants, which are known to be flammable.
- E. Limit use of plants, which develop large amounts of foliage, branches, or dead material.
- F. Limit use of plants, which develop deciduous or shaggy bark.
- G. Limit use of plants, which develop dry or dead undergrowth.
- H. Recommended spacing of trees is a minimum of 20’ feet between mature canopies.
- I. Tree canopies shall not reach to within 10’ of chimneys or structures.
- J. Limb up trees 1/3 height or 6’ from ground. Street trees to be limbed up 14’6”.
- K. No tree canopies overhanging any onsite road.
- L. Shrubs to be fire resistive. Shrubs shall be spaced to create a firebreak between groupings.
- M. Eliminate potential for vegetation on ground (ground fuels) to spread fire into trees (aerial fuels). This is known as eliminating the “fire laddering effect”.
- N. Configure plantings so that they are spaced and maintained so as not to create a direct path from native growth to a structure.
- O. All plant species must be limited to those approved by the Fire District for this area.
- P. Prohibit massing of vegetation adjacent to structures, especially under eaves, overhangs, windows, vents, decks, within 10’ of chimneys, etc.

- Q. Vegetation management requirements and the provisions for continuous maintenance must be documented on landscape plans, any CC&R's, and deed encumbrances. It must be absolutely clear to building owners that they have a legal responsibility to maintain a fire safe defensible space on all sides of the structures in compliance with this plan and the Fire District requirements. The Fire Marshal shall enforce all vegetation management requirements, and structural protection requirements on all private property, and assure vegetation management requirements are met. Yearly maintenance, before fire season (typically May 1, including during construction), and more often as needed, is required to reduce fuel volumes, eliminate weeds, remove dead vegetation, cut grass, limb up and prune, remove down and dead fuels, remove flammable under story, etc.
- R. Maintenance is also required after any storms or high winds to remove down and dead vegetation and combustible debris from properties and zones.
- S. If new planting is desired in areas of retained native vegetation, then an irrigation system shall be designed to sustain new plantings as needed. Caution should be used so as to not over irrigate natives and thereby increase the dead to live fuel ratio; negating the high leaf moisture.
- T. Caution must be used so as to not cause erosion or ground (including slope) instability, or excessive water runoff, due to planting, landscaping, vegetation removal, vegetation management, or irrigation.
- U. No combustible netting, matting, etc., in landscaped areas, on slopes, etc.
- V. Permission is required from offsite parcel owners if any fuel modification is needed offsite of any parcel in this project, and on someone else's property.
- W. Permission must be obtained in advance from resource agencies, and any other applicable agencies, before doing vegetation management in any sensitive areas or habitats. There are apparently some vernal pools on the property.
- X. In the event of a prolonged drought or prohibition of irrigation, plants (including groundcover, shrubs and trees) which require irrigation may need to be removed and replaced by fire resistive drought tolerant plants. All dead and dying vegetation will need to be removed.



## **6. Structural Fire Threat:**

The most likely threat of a significant onsite fire would be a structural fire. The most likely sources of the fire would be from one of the following:

- Electrical system malfunctions; particularly wiring and extension cords.
- Fire in high piled stock due to carelessly discarded smoking materials (from someone sneaking a smoke), electrical or heating source, chemical reaction, etc.
- Fire or explosion at an industrial plant.
- Spotting of airborne burning debris from an offsite, wind driven, vegetation fire onto a roof of into an HVAC inlet, open smoke vent, through other building vents, open door, or through a broken glass window (broken due to airborne debris).
- Heating equipment or system malfunction.
- Careless smoking.
- Truck fire spreading into building from loading dock.
- Arson to cover up a crime.
- Forklift fire.
- Ignition of hydrogen from charging batteries for fork lifts.
- Refueling LPG forklifts inside a building.
- Spontaneous heating or chemical reactions of stock.
- Welding or open flame during construction of racks, etc.
- Storage too close to ceiling light fixtures (hot surface).
- Fire in exterior storage due to chemical reaction, carelessly discarded smoking material, arson, etc.
- There is a potential for a plane crash into a building or power plant due to proximity of the airport.

There will probably be large warehouses, and manufacturing facilities, constructed on the various lots. Fire threats in warehouses are based upon large amounts of materials located in a single fire area or building. Commonly stored plastic materials have the potential to burn rapidly, have high rates of heat release, and generate large amounts of combustion products. Depending upon the type of materials stored, rapidly spreading fires can occur and overpower fire sprinkler systems. Industrial manufacturing risks vary based upon the type of industry. These occupancies may be "H" occupancies per the Building Code and will need to comply with the Building Code (including size and construction of buildings, location on property, distance from property line and other buildings, etc.) in addition to the Fire Code. Occupancies with materials containing a high explosive hazard (typically an H-1 occupancy per CBC) are not allowed by the Specific Plan. This should also include fireworks manufacturing or storage. Special attention is needed for H-2 occupancies; those with combustible dusts involved, and which present a moderate explosion hazard or hazard from accelerated burning, per Section 307.4 of the 2007 California Building Code. This includes certain uses and storage of flammable liquids, oxidizers and class 3 water reactive materials. H-2 occupancies must be located at least 30' from a property line if the building is over 1000 square feet, per 2007 California Building Code Section 415.3.1. Buildings where explosion venting is required per 2007 California Fire Code Section 911 and 2007 California Building Code Section 415, require a clear vertical space above the building or an unobstructed 50' horizontal distance from the structure wall at a location where the explosion venting system is. Refer to the codes for details. It will be important for the owner of the



development to have their architect analyze all specific requirements for a proposed occupancy on a lot before finalizing proposed lot sizes and before proceeding with design, to be sure the size and type of occupancy will be feasible based on lot size, distance to property lines and adjoining buildings, public ways, etc. In addition, the Fire Code has specific requirements for the amount and type of hazardous materials, flammable and combustible liquids and flammable gases stored on the exterior of buildings on the lot.

H rooms designed in accordance with the Building Code may be allowed within buildings. The H occupancy classification can be avoided by staying within exempt quantities and by the use of control areas as allowed in the Fire and Building Code.

Large quantities of exterior storage are discouraged due to the potential fire exposure hazard. Quantities of exterior storage should not exceed exempt quantities per tables in the Fire Code.

Suitable setbacks of buildings from the Border are recommended as there is no control over what can be built or stored on the other side of the Border and it cannot be enforced by the Fire District. In addition, 6' high solid masonry walls, with security protection should be provided on those property lines.

### **Vegetation Fire**

As all of the land will be built upon and landscaped, the current vegetation fire hazard will be reduced. Currently, the East Otay Mesa area is generating about 12-15 vegetation fire calls per year in the entire Specific Plan area. The main fuels are what are referred to as flashy fuels (grasses) which spread fire rapidly and serve as a fuse to spread fire into the chaparrals.

While the natural vegetation will be reduced, it will be important to control all landscaping in, and on perimeter of, the development, and on all lots, as the area now becomes an Urban Wildland Interface. This also includes controlling vegetation on roadways, to assure that such ornamental vegetation and trees do not provide a means to transmit fire to a structure or to obstruct roads.

### **Hazardous Materials**

In addition to EMS calls and Fire calls, there is a potential for Hazardous Materials emergencies in the project. These can occur in transportation, storage, use and handling. Hazardous Materials include combustible and flammable liquids, flammable gases, toxic liquids and gases, explosives, reactive and unstable materials, oxidizers, etc. The incidents will most likely occur on the freeway or other roads during transportation. This potential creates the risk of a flammable or toxic cloud or spill impacting a highway as well as exposing humans and buildings on either side of the Border. Leaks or releases of Hazardous Materials from trucks can occur at the truck plaza.

The proliferation of Hazardous Materials in industry, especially high tech industry, will result in the potential for a release. Such release, if a gas, can result in a flammable or toxic cloud, which can leave the property of origin and expose persons and property offsite.



With the large amount of square footage proposed for the development, there could be Hazardous Materials events during the life of the occupancies. Most will be small spills or releases.

A major fire in an industrial or storage facility may result in a major Hazardous Materials release, or toxic smoke spreading offsite.

### Aircraft Crashes

There is the potential for air crashes in the area, due to Brown Field. This would most likely be a cargo type aircraft. An increase in small aircraft traffic can result in mid air collisions over the development area. This project does not, however, increase the risk of air crashes.

## **7. Emergency Response:**

Currently, the closest Rural Fire Protection District Fire Station is interim Station #68 at Bailey Prison at the north end of Alta. A ten-year lease exists between the RFPD and the County. The station is staffed 24-7, year around with seven on duty personnel. There is a structural Type 1 engine and a brush, Type 111, engine. Response distance is approximately 2.9 miles. In addition the RFPD Engine Company at Donovan Prison can respond if not committed on another incident. A staffed RFPD quint/ladder truck is planned for the East Otay Mesa in the future as this area continues to develop. Until then, ladder truck support will come from the Chula Vista Fire Department via Automatic Aid and should be available via Mutual Aid from San Diego City. The San Diego City Fire Department has an Engine Company a Station 43 at Brown Field, but response is questionable due to current lack of automatic aid agreements assuring response. Their closest ladder company is 6 miles away. The Chula Vista Fire Department has an Engine and Truck Company available via automatic aid from station 7. Estimated response times are about 7 minutes/6 miles via SR 125 if available for response. The applicant and parcel owners will be required to make financial arrangements with the Fire District, to provide funding towards improving future public Fire Protection in this area. No one project is expected to fund all of the needed public fire protection in East Otay Mesa.

The proposed buildings will need supervised fire protection and suppression systems and a high level of built-in fire protection to be relatively self sufficient from a fire protection standpoint, which will reduce the need for a large initial response of firefighters. The type and configuration of storage must be regulated by Tenant Improvement requirements established by the Fire District and the County DPLU Building Division at the time tenant improvement plans are submitted.

It is recommended that the developer, owners and developers of various buildings, contact their insurance carriers to ascertain what emergency response requirements the carrier may have in order for them to provide insurance. Fully sprinklered buildings should be assumed, and credit should be given for sprinklers.

The objective of this plan is to set forth, in concept, examples of the Fire District Requirements, County Department of Planning and Land Use Fire Code requirements, County and State Building Code requirements, and the recommendations of the consultant, including various standards, in order to notify potential and future owners and tenants of lots as to the potential requirements and the recommendations regarding adequate protection. The recommendations and requirements in this plan should follow with any new parcel maps and be included with the conditions of approval for each lot. Focused Fire Protection Plans and submittals will be required for each lot at time of proposed development on the lot. Any "recommendations" in this plan shall be made mandatory "shalls" in the future focused Fire Protection Plans.



**8. Access:**

The development is served by existing, major industrial type public roads, including the following offsite roads: Alta Road (64' paved width), Airway (interim 32' paved width, ultimate 48' paved width) and Siempre Viva east of Brown Field (interim 32' paved width, ultimate 64' paved width). These are shown on Thomas Guide page 1332. The driving width of roads in the development are 52' to 68' wide, paved, and unobstructed by parking spaces. Secondary access is provided and is not an issue with this development. Parking should be controlled so that a minimum 24' width unobstructed fire lane is always maintained.

The developments on each lot should comply with the following general standards, recommendations, and requirements for industrial/warehouse roads and driveways, and are required to be constructed to current County Industrial Road Standards and improved with approved paving:

- A. All onsite roads, including on site driveways on individual lots must be paved to support heavy trucks. The County Fire Code requires the roads and driveways to support a 50,000-pound fire apparatus. Roads and driveways must meet these criteria and must also be designed to support heavy semi-trucks and fire trucks. It is recommended that all roads and on site driveways be designed to withstand the weight of a future aerial ladder fire truck, which would be about 65,000-75,000 pounds. Note that the public roads are under construction. They will reportedly be designed for heavy truck loads. Design of future on site roads shall meet RFPD requirements and County requirements and shall also be designed to support an Aerial Ladder truck.
- B. All roads providing access to these parcels are required to be named with proper signage at all intersections to approval of the Fire District and DPW.
- C. At signalized intersections, the developer is required by the Fire District to install pre-emptive traffic devices (Opticom).
- D. Onsite fire apparatus roads on individual lots should be at least 26' wide unobstructed width (unobstructed by parking). It should be clear to the sky of any overhangs. For buildings 28' high from accessible grade, the road width should be 28' unobstructed width clear to the sky for aerial ladder operations. Roads shall be within 150' driving distance of any portion of an exterior wall. Where possible, onsite roads should encircle the building for fire truck access. Onsite parking must be controlled to maintain the onsite access road widths at all times.
- E. Centerline of onsite access roads should be located parallel to and within reasonable proximity of the exterior walls of a building, to allow proper/safe use of ground or aerial ladders by firefighters.
- F. Owner should record a "Yard Agreement" on each parcel to guarantee that the required on site fire access roads are kept clear of vehicles, trailers, storage and structures. Note: Consultant states that this is a very important issue for properties such as this with many trucks and trailers coming in and out, and perhaps needing

to park overnight until unloaded or loaded. It is also important that no temporary modular or trailer offices, etc, are located in fire access roadways.

- G. There should be a recorded requirement on each lot to maintain all roads and driveways.
- H. Fire lanes need to be posted "No Parking-Fire Lane". It is recommended by the consultant that the signage be bi-lingual.
- I. Dead end roads or driveways exceeding 150' shall have Fire District approved turnarounds. Cul-de-sac bulbs should be at least 84' in diameter for fire truck turning.
- J. All buildings should be separately addressed off the closest public entrance road. Addresses and unit numbers should show on each side of the buildings and be to Fire District approval. Numbers to be 6" high with ½" stroke.
- K. Geographical directories may be required at entrances to multiple building developments on a parcel.
- L. Firefighter foot access, 6' wide, all weather, should be provided around all sides of buildings.
- M. Actual location and size of Fire truck access and firefighter foot access to be to approval of Fire District at time of submittal of detailed plans on any parcel.
- N. Any gates shall comply with the requirements of the RFPD and the County DPLU Fire Marshal. Gates are required to have KNOX switches, which override all other command functions and open the gate. They shall also have emergency traffic control-activating strobe light sensors (Opticom) or other devices approved by the Fire Chief, which shall activate gate on approach of fire apparatus, and have a battery backup or manual mechanical disconnect in case of power failure. All gates and their controls are to be to approval of Fire Chief.



## **9. Water Supply, Hydrants, and Fire Sprinklers:**

The fire flow will be provided by the Otay Water District. Hydrant spacing on the public streets should be 300'. The fire flow, calculated by the Water District on 8-14-06, at request of the consultant, resulted in the following data:

- Static pressure: 136.4 PSI
- Residual pressure: 130.8 PSI
- Flow at 40 PSI: 14,556 GPM
- Flow at 20 PSI: 16,214 GPM

Based on this data from the Water District, there appears to be very adequate water available for needed fire flows. Pressures also appear adequate for sprinkler systems, as per the Water District calculations, about 125 PSI residual is available at 5000 GPM flow. In fact, pressure reducers could be needed in the system to protect fire protection systems. Actual design of the water system and fire protection systems including determination of available and needed GPM and PSI is the responsibility of the Project engineer and the water district and is out of the scope of this plan.

The Water District letter and hydraulic curve is in the Appendix of this plan.

The Fire District requires fire hydrants be installed every 350', including on site, and that the hydrant system be capable of delivering at least 2000 GPM at 20 PSI to a building. The District and County Fire Codes require a minimum of 2500 GPM in the water main system in Wildland Urban Interface areas. This plan recommends hydrants be located every 300' on public roads and onsite roads due to the industrial use.

The Fire District states that the available fire flow must be sufficient for the sprinkler system supply plus 500 GPM allowance for hose streams or be designed to provide the Fire Flow required by Fire Code Appendix B-105 (based on square footage and type of construction), with a 50% credit for sprinklers, whichever flow is greater. Needed fire flows to be available at times of maximum peak domestic and industrial flows. The engineers and sprinkler designers for this development need to ascertain the actual required Fire Flows, from the Fire District and DPLU Fire Marshal, when doing detailed water system design for the development and various lots, and when designing buildings.

Actual sizes of the buildings are not known by applicant at this time.

### **Additional Recommendations and Requirements:**

- A. The onsite water supply at any building should preferably be an extension of the Public Water supply, per the RFPD Fire Chief, so that ongoing maintenance and operability can be assured by the water company. Any onsite main size should be at least 10", and greater if needed, to properly supply the worst case needed fire flow and pressure to buildings and sprinkler systems. Detailed plans for any onsite public or private water system shall be submitted to the Fire District and DPLU for review and approval. The public and private water systems must be sized to provide the needed flow and pressure, including the most demanding

sprinkler system flow plus hose stream/fire hydrant flow allocations as determined and required by the Fire District and the DPLU Fire Marshal. Any private systems shall have at least two connections (custody transfer stations) to the public water system and shall have multiple approved Fire Department connections within 50' of a public fire hydrant to allow Fire District to pump into the private loop if needed.

- B. All buildings on any parcel will have fire sprinkler systems, which are remotely supervised, including all valves, to an approved 24/7 alarm monitoring company. Risers and valves shall be on exterior of building or in a 1 hour rated room directly accessible from exterior. The systems may be ESFR systems or non-ESFR systems with in-racks if needed. The required fire flow for the sprinkler systems is based upon the anticipated commodity and storage height, or the manufacturing risk whichever is applicable. The County standard for spec buildings is .45/3000. However, much higher flows may be needed as shown on the generic table on the following page. It is critical that the private water system, points of connection to the public system, and the risers be designed for the highest potential sprinkler demand plus hose stream/hydrant allocations per Fire District, based upon the potential tenants. Note that certain occupancies could require other types of fire suppression systems such as foam, water mist, etc.

The table on the next page is provided by the consultant at request of the Fire Chief. This table includes generic examples of potential sprinkler and hose stream demands based on the type of hazard. Actual sprinkler system design and determination of needed fire flows for sprinkler systems, and for hose streams/fire hydrants, is the responsibility of the engineers and the sprinkler designer and is out of the scope of this plan. Official fire flow requirements will be established by the Fire District and the DPLU Fire Marshal.



**ESTIMATED FIRE SPRINKLER DEMANDS BASED ON OCCUPANCY/USE (GENERIC EXAMPLES)**

| OCCUPANCY/USE                                     | DENSITY (gpm/sf)  | Area of Application (sf)                              | Sprinkler Demand (gpm)<br>(with imbalance) | Hose Demand<br>(gpm) | Total Demand<br>(gpm) |
|---|-------------------|---|--|----------------------|-----------------------|
| Spec Warehouse (< 25' ht)                         | 0.45              | 3000  | 1485                                       | 500                  | 1985                  |
| Spec Warehouse (> 25' ht)                         | 0.60              | 3000  | 1980                                       | 500                  | 2480                  |
| Spec Warehouse (w/ EFSR)                          | ESFR              | Special Application Sprinklers Flowing<br>12-13 heads | 1750 <sup>1</sup>                          | 250                  | 2000                  |
| High Piled Group A Plastics                       | ESFR              | Special Application Sprinklers Flowing<br>12-13 heads | 1750 <sup>1</sup>                          | 500                  | 2250                  |
| High Piled Flammable Liquids<br>(25' high)        | 0.60              | 3000+ in rack sprinklers                              | 2530                                       | 1000                 | 3530                  |
| Hazardous Materials (H room)                      | 0.60              | 3000+ in rack sprinklers                              | 2530                                       | 1000                 | 3530                  |
| Flammable Liquids Spraying                        | 0.40              | 2500 (ex.haz.gr.2)                                    | 1200                                       | 500                  | 1700                  |
| Rubber Tire Storage (20' high <sup>2</sup> )      | 0.40              | 3000+ 1 level in-racks                                | 1585                                       | 500                  | 2085                  |
| Rubber Tire Storage (20' high <sup>3</sup> )      | 0.60              | 3000  | 1980                                       | 500                  | 2480                  |
| Big Box (Home Depot, etc.)                        | ESFR              | Special Application Sprinklers Flowing<br>12 - 13     | 1750 <sup>1</sup>                          | 250                  | 2000                  |
| Recycling facility (parts, etc.)                  | 0.20 <sup>4</sup> | 1500  | 360  | 250                  | 610                   |
| Manufacturing (low hazard)                        | 0.20              | 1500  | 360  | 250                  | 610                   |
| Manufacturing (high hazard)                       | 0.40              | 2500  | 1100                                       | 500                  | 1600                  |
| Research and Development                          | 0.20              | 1500  | 360  | 250                  | 610                   |
| Indoor Storage and Hazardous<br>Materials Storage | 0.17 <sup>5</sup> | 3000  | 610  | 250                  | 860                   |

1 Fire Pump typically required to meet flow and pressure demands

2 Fixed racks, on pallets, on-side or on-tread (10' Max. clearance between sprinkler deflector and max-storage ht.)

3 Fixed racks, w/o pallets, on-side or on-tread (10' Max. clearance between sprinkler deflector and max-storage ht.)

4 Higher densities required if high piled storage included

5 Minimum flow rate (Ordinary Group 2) over minimum 3000 sf operating area per CFC Article 80, Section 8003.1.6. Higher densities and hose demand may be required based on commodity and storage height.

- C. Any warehouse buildings should be designed for at least .45 over 3000 or more if determined necessary by the sprinkler designer, plus hose stream allowances, to assure adequate protection for the tenant occupancies. Actual system design and calculations are the responsibility of the sprinkler designer and engineer and are out of the scope of this plan. The building owner/developer will be responsible to assure the design and installation of the sprinkler systems, risers, and water supply, to provide the required sprinkler system demand plus hose streams, and determine the total needed fire flow based on the contents, commodities, building size and type of construction per Fire District and DPLU Fire Marshal requirements. The developer and system designer need to also assure that the needed fire flow is available. All detailed sprinkler system designs and calcs, and proposed fire flows for the water mains, shall be submitted to Fire District and DPLU Fire Marshal for review and approval prior to construction. Fire protection system plans relative to tenant improvements and change of occupancies, need to be submitted and approved by the Fire Agencies, prior to any future occupancy or tenant change.
- D. Separate Fire Department sprinkler connections (FDC) should be provided for each separate building. They should be located about 4' in from the public street curb; at least 40' from the building, in front of the building (address side). There should be a fire hydrant (public hydrant) within 25' of the connection on same side of road. Buildings requiring a fire flow of 2,000 GPM or greater, shall have a 4 inlet FDC. In addition, an FDC with an approved number and size of Fire Department connections should be required at each double backflow point of connection from public to private water system (Consultant note: So that any private system can be charged by Fire Department from public water supply.) Listed one-way check valves shall be installed in the proper locations. Consultant recommends that all double backflow prevention devices be UL listed or FM approved for fire service and have indicating O. S and Y valves supervised and locked in operating position, and that they be visible from public street accessing the building.
- E. Sprinkler systems and all valves to be supervised to an approved 24/7 monitoring company. Consultant recommends that they also be locked in the operating position.
- F. Sprinkler alarm bell to be on building facing street the building is addressed on. The bell should also have a flashing red light to indicate which riser is flowing. Consultant recommends that signage on bells stating to call Fire Department-911 if bell ringing shall be bilingual.
- G. Required fire flow for sprinklers could be as much as 3530 GPM or more. Actual design is up to the Fire Sprinkler Contractor.
- H. Buildings on any parcel will need to have fire protection systems designed to operate within the available fire flow and pressure from the public water system, or will require a private water system with stored water and fire pumps. This can also result in a limitation of type or size of occupancy.



- I. A recorded CC&R document, or other approved legal document which outlines care and maintenance of any private water system, should be provided to the Fire District for approval. This document should include the maintenance and compliance of onsite Fire Lanes.
- J. The water system, whether public or private, must be designed to the standards of the Otay Water District, the Rural Fire Protection District, and AWWA Standard M-31; "Distribution Requirements for Fire Protection" latest edition (currently the third edition). NFPA 24 shall also be followed for a private system.
- K. Hydraulic fire protection water system calculations shall be submitted to the Fire District and DPLU Fire Marshal for approval prior to construction. Consultant recommends that the plans for any private water system, and any onsite sprinkler and hydrant system, also be submitted to the Fire District and DPLU Fire Marshal for review and approval prior to construction. This shall include locations of hydrants, FDC's, PIV's, isolation valves, lateral valves, and risers.
- L. Risers and valves should be on exterior of building or be in a fire rated enclosure directly accessible from exterior of building.
- M. Fire hydrant layout shall be as approved by Fire District. Onsite hydrants are required when the distance from a hydrant in the street exceeds 150' driving distance onsite. New hydrants should be spaced 300' apart on public roads and 300' apart on onsite access roads. Fire District requires the fire hydrant system to flow at least 2000 GPM at 20 PSI at a building. Fire hydrants should be located at least 40' from buildings or have a 2 hour fire wall at location of hydrant.
- N. Hydrants to have two 4" outlet connections and one 2.5" outlet connection per the Fire District, and the Water District standard and as needed for industrial fire operations.
- O. Lateral valves should be 10-25' from (front of) hydrant.
- P. Hydrants, sprinkler connections, PIV's, FDC's, and any exterior sprinkler risers located closer than 4' to the face of any curb (consultant note: or close to any areas of truck traffic including backing) must have crash posts at least 6" in diameter, constructed of schedule 40 steel, concrete filled, spaced not more than 4' between posts on center, set not less than 3' deep in an adequate concrete footing of not less than 15" diameter, and set with posts not less than 3' aboveground. Posts must not block operation of fire hydrants or Fire Department Connections.
- Q. Hydrants must have no obstructions within 3' and no trees within 10'. Consultant recommends same for Fire Department Connections.
- R. Hydrants should have a 3'x 3' concrete pad around base to prevent build up of weeds and vegetation. If hydrants are dry barrel, gravel shall be used instead.

- S. Blue dot hydrant markers must be installed at each hydrant. Red dot markers must be installed at each FDC.
- T. There should be a zoned graphic fire alarm annunciator at the main entrance to each building on the address side. Consultant note: annunciator to monitor and annunciate all sprinkler risers and zones and any smoke detection zones.
- U. Any required fire pump system requires two redundant listed or approved fire pumps complying with NFPA 20. One of the pumps should be a diesel or approved emergency power shall be provided.



**10. Building Construction and Additional Requirements:**

In general, new warehouses are concrete tilt up construction. They are one-story buildings generally ranging from approximately 26' high to 38'6" high. It is recommended that buildings be separated by at least 50'. Maximum height should be limited to 60'. Buildings should be set back at least 30' from property lines. The buildings should have parapets to assist in controlling fire spread. It is recommended by the consultant that the parapets be 6' or less, to a minimum of 30", and that the parapets have suitable, approved, roof access points through the parapet on each side of each building, at the corners and in the middle of the wall between each end on each side, for Fire Department Ladder truck crew access, through the parapet wall, after dismounting a ladder. Such access points should be marked with reflective signage on both sides, allow access directly onto or off of the roof itself, without climbing over the parapet, and shall not be locked. Details shall be submitted to the Fire District for approval.

Warehouse buildings generally have small (4,000 to 10,200 square foot) offices, which have HVAC systems. Warehouses may not have HVAC systems. All HVAC systems should have the capability to be easily shut down or put on recirculation, by occupants or firefighters, using readily accessible and labeled controls, so as to not allow smoke to enter the building in the event of a vegetation fire in the area, and be properly screened to prevent intrusion of sparks and burning debris.

Warehouse buildings may be classified, per Building Code, as B (office) S-1 (Moderate hazard storage not classified as S-2), S-2, or H. Industrial/manufacturing buildings are either F-1 or 2, or H occupancies.

Various potential requirements and recommendations. (The Ignition Resistant construction requirements per the County Building Code Section 704.A, and the State Building Code Chapter 7-A, for WUI areas, will be followed as applicable):

- A. Buildings storing high piled stock will have smoke vents, or approved smoke removal systems, for high piled stock. Smoke vents should have tempered glass and have the capability to be opened manually on roof, or from warehouse floor area by firefighters' use of a latch, etc.
- B. All buildings should be provided with the means for firefighters to remove smoke, such as openable roof vents or approved smoke control and removal systems.
- C. The buildings will have the required number of parking spaces. This will help minimize the potential for parking in fire lanes.
- D. The buildings may have numerous truck wells/docks and overhead doors due to the use.
- E. Interior partitions between tenant units in buildings should be at least 1-hour fire rated walls, or may be required to be a higher rating if required by the CBC.
- F. Note that certain occupancies could require explosion control or venting per the Fire and Building Code. Refer to 2007 CFC Chapter 911 for when this is required.



This will require approved vertical explosion venting or a clear space of 50' in horizontal width on exterior of the building wall, and on the same lot. Also refer to CBC 414.5.1 and CBC 415.

- G. Due to lack of Fire Department staffing and Aerial Ladder Truck, remotely supervised, zoned, smoke detection systems should be installed in all buildings over 40,000 square feet in order to detect a fire while it is still small, or such buildings should be divided by fire walls every 40,000 square feet.
- H. Buildings to have KNOX data and key boxes to Fire District approval. It is recommended by consultant that the data boxes also contain a suitable floor plan, showing location of sprinkler risers, alarm panels, HVAC controls, gas shutoffs, electrical panels, any roof access stairs, and an updated list of the types of commodities stored in the building.
- I. Buildings should have approved stairways to provide Firefighter access to roof due to lack of ladders to reach the roof until a ladder truck is placed in service in East Otay Mesa. Any locks on door to stairs to be openable by Firefighters, from outside of stairwell, with a Fire Department KNOX lock key.
- J. Any buildings intended for high piled stock shall comply with Chapter 23 of the Fire Code, including firefighter access doors, having hardware openable by firefighters from exterior with a KNOX key, every 100' lineal feet, smoke vents or smoke removal systems per the Fire Code, and wet standpipes. The consultant recommends that smoke vents be openable manually from rooftop and from warehouse floor. High Piled stock buildings should assume storage of high hazard commodities and plastics.
- K. Any awnings on buildings, such as over the loading docks, should be non-combustible, sprinklered and designed so as to not collapse during a fire.
- L. Any storage or use of hazardous materials, combustible or flammable liquids, compressed gases, etc., shall comply with District Fire Code. Consultant also recommends that there be no storage of fireworks, explosives, or flammable or hazardous compressed gases. Hazardous materials and flammable or combustible liquids, various gases, etc, must be kept below Maximum Allowable Quantities (exempt quantities) if these occupancies are not designed as H occupancies. Hazardous materials or flammable liquid storage rooms (H rooms) may be allowed by the Fire District and the Building official, if exempt quantities are exceeded, after use of control area provisions of the Code. Exterior storage of LPG, LOX, Ammonia, acids, flammable or combustible liquids or gases, and other hazardous materials, should be located away from buildings and property lines and should have proper built in fire protection. Water spray systems may be required. Chapters 27 and 34 of the 2007 Fire Code list the required distances from buildings, property lines and public ways for hazardous materials and flammable and combustible liquids. Chapters 30 and 35 regulate compressed gases. LPG is regulated by Chapter 38. Developers and Architects for specific lots



- must check the Fire Code exterior storage and spacing requirements when designing a building and lot.
- M. Any fueling of vehicles on lots must comply with Fire Code Chapter 22.
- N. Any parking structures to comply with NFPA Standards and the Fire Code including fire sprinklers and wet standpipes.
- O. Any building storing Hazardous Materials or flammable or combustible liquids shall have the NFPA hazard (diamond) signal displayed on the street side of the building and over the entrance to the storage area. Occupancies with significant hazardous materials risks should provide additional funding, above the basic RFPD funding requirements, for Hazardous Materials equipment, firefighting foam, etc.
- P. Roofs shall be Class A fire rated roof assemblies, (if available for flat roofs if they are used), in compliance with the County Building Code Section 704.A and also with State Building Code Chapter 7-A. Roof coverings where a profile allows space between covering and roof decking shall have any space at ends, or elsewhere, fire stopped to prevent intrusion of flame or burning embers. If Class A roof assemblies are not yet available for flat roofs, then Class B roofs, may be acceptable to DPLU Fire Marshal, upon submittal of a request for Alternative Methods to the Fire District and the DPLU Fire Marshal. (based on a telecon with Ralph Steinhoff, DPLU, on 7-28-06 regarding this issue).
- Q. When provided, exposed valley flashings shall not be less than 0.019 inches (No. 26 galvanized sheet gage) corrosion resistant metal installed over a minimum 36 inch-wide underlayment consisting of one No. 72 ASTM cap sheet running the full length of the valley.
- R. There should be no light wood on exterior of buildings. Heavy timber is okay. Exterior walls will most likely be tilt up concrete. Exterior walls will be of approved non-combustible or ignition resistant materials as required by the Building Code based on size and type of occupancy. 2" nominal solid blocking will be installed between rafters at any roof overhang. Exterior wall coverings shall extend from top of foundation to the roof and terminate at 2" nominal solid wood blocking between rafters at all overhangs, or in the case of enclosed eaves, terminate at the enclosure.
- S. Any eaves and soffits, shall meet the requirements of SFM 12-7A-3 or shall be protected by ignition resistant materials or non-combustible construction on the exposed underside.
- T. Protection for vents on buildings shall comply with County Building Code Section 704A.2. No vents in soffits, rakes, eaves, eave overhangs, cornices, between rafters at eaves, or other similar exterior overhangs. HVAC intakes should also have proper screens. Vents should be designed to prevent intrusion of airborne burning debris from a vegetation fire or other exposure fire. Vents shall



- have louvers and ¼” mesh screens per Chapter 704A.2.1 of the County Building Code.
- U. Any turbine vents shall be designed to rotate in one direction only so as to not suck smoke and burning debris into a building
  - V. Exterior windows, window walls, glazed doors and glazed openings within exterior doors shall be insulating-glass units with a minimum of one tempered pane, glass block units, tempered glass, or have a fire resistance rating of not less than 20 minutes, per CBC Chapter 7-A. Glazing frames made of vinyl material shall have welded corners, metal reinforcement in the interlock area, and be certified to ANSI/AAMA/NWDA 101/LS 2-97 structural requirement.
  - W. Exterior door assemblies shall comply with the performance requirements of Standard SFM 12-7-A-1 or shall be of approved non combustible construction or solid core wood having stiles and rails not less than 1 3/8” thick with interior field panel thickness no less than 1 ¼” thick, or have a fire resistance rating of not less than 20 minutes. Refer to County Building Code Section 704A.3.2.3. Approved non combustible or exterior fire retardant treated wood vehicle doors are not required to comply with this Section
  - X. Skylights shall be tempered glass. Alternative equivalent materials may be submitted for approval of Building Official, if tempered glass would affect operation of smoke vents, due to weight.
  - Y. Roof gutters shall be provided with the means to prevent the accumulation of leaves and debris in the gutter.
  - Z. Trash areas/containers will be on exterior of buildings, and should not be connected to interior of a building. The locations shall be to approval of the Fire District. Trash dumpsters within 5’ of a building should have exterior sprinkler protection or be in a 1 hour rated enclosure.
  - AA. Fire extinguishers shall be provided throughout all buildings, including at each loading dock door (in the event of a truck fire).
  - BB. Wet standpipes will be installed where required.
  - CC. Paper faced insulation is prohibited in attics and ventilated spaces.
  - DD. Decking, floors and underfloor protection; County Building Code 704A.4.1.: Exterior balconies, carports, decks, patio covers, unenclosed roofs and floors and similar architectural appendages and projections shall comply with sections 704A.4.1.2 and 704A.4.1.3
  - EE. Decking surfaces, stair treads, risers and landings of decks, porches and balconies shall be constructed of approved non-combustible materials, exterior fire retardant treated wood heavy timber, one-hour fire resistant materials or alternative



materials which comply with section 704A.4.1.4 of the 2007 County Building Code. Any awnings, umbrellas, or covers should be fire retardant or non-combustible.

- FF. Underfloor and appendages protection: the underside of cantilevered and overhanging appendages and floor projections shall maintain the ignition resistant integrity of exterior walls, or the projection shall be enclosed to grade. Buildings shall have all underfloor areas enclosed to the grade with exterior walls in accordance with County Building Code section 704A.3, per County Building Code section 704A.4.2.
- GG. Sprinkler head deflectors and lighting fixtures shall be so located to assure a 3' clearance from storage, or more if necessary.
- HH. Fences or structures less than 5 feet from a building: Any portion of a fence or other structure less than 5 feet from a building shall be constructed of approved non combustible material, pressure treated exterior fire retardant wood or material that meets the same fire resistant standards of the exterior walls of the building. Material with Fencing along the border should be solid masonry block walls.
- II. Forklift refueling stations to be outside.
- JJ. Battery charging to have proper protection/ventilation/spill control.
- KK. Tenant improvements/Fire Permits: Plans for Tenant Improvements shall be submitted to the Rural Fire District and the County Department of Planning and Land Use for review and approval prior to occupancy of any original or subsequent tenant. Plans shall include Fire sprinkler plans and calcs, and shall also address all applicable Fire Code requirements and High Piled Stock permit submittal requirements as found in Chapter 23 of the State and County Fire Code. Any Fire Permits required by the State and County Fire Code, shall also be applied for.
- LL. Redundant methods to call 911 should be provided, such as hard line phones and cellular phones. The preference for a primary method is use of the "land line" phone to assure the Public Safety Answering Point (PSAP) who receives the call can identify location of the site.
- MM. Emergency plans: Each tenant should have a bi-lingual Emergency Plan which includes steps for employees to take in an emergency, and makes it clear who is assigned to call 911. Manual fire alarm systems will be provided as needed to alert employees.
- NN. Onsite fire lanes shall be identified in a manner acceptable to the Fire District to prevent parking therein. Any truck parking on the streets needs to be controlled so that a minimum 24' wide unobstructed fire lane is maintained.

- OO. All buildings are required to have approved addresses visible and readable from the street.



**11. Residential Occupancies:**

Residential occupancies are not proposed at this time for this development. Any residential occupancies, if proposed in the future, shall comply with RFPD and County Fire Codes requirements, the WUI requirements of the County Building Code and State Building Code Chapter 7-A, for new construction in the Wildland Urban Interface. It must be assured that there will be no offsite fire, explosion or hazardous materials impacts upon a residential development from any event at the power plant.

**12. Institutional Occupancies:**

No institutional occupancies are proposed for this subdivision at this time. Any future institutional occupancy will be required to follow all applicable codes and ordinances, in addition to the general guidelines in this plan. Detailed plans shall be submitted to the Rural Fire Protection District for review and approval prior to any construction on the parcel.



### **13. Summary/ Disclaimer:**

This Conceptual Fire Protection Plan is for the approval of vacant lots only and responds to the requirements of the Rural Fire Protection District and the County Department of Planning and Land Use. Focused Fire Protection Plans will be submitted for each lot at time of design of buildings on the individual lots. No buildings have been designed at this time. It also complies with the requirements of Section 4703 of the County Fire Code, which requires a Fire Protection Plan for all new development in the Wildland Urban Interface. It also includes the recommendations of the consultant based upon the potential risks and the necessary mitigations.

As fire can be unpredictable and dynamic, this plan cannot guarantee that a fire will not occur or will not cause damage to property or injury or death to occupants. There are no guarantees made, expressed or implied, regarding the adequacy or effectiveness of any recommendations or requirements in this plan for all fire situations. However, the Fire Protection concepts proposed in this plan should result in well-protected projects that lessen the impact upon the Fire District.

Engineering, architecture, design and construction are out of the scope of this plan and are the responsibility of others.

Focused Fire Protection plans will be required at time of any development on any parcel. Such plans shall change any "recommendations" in this plan to mandatory "shall" language, as modified to fit the particular development, as long as equivalent protection is provided and approved by the Fire District and by the DPLU Fire Marshal and/or Building Official.

Owners or developers may submit requests for review and approval of Alternative Materials and Methods which have the same practical effect and equivalency as the materials and methods required or recommended in this plan.

**APPENDIX**

1. Site Map
2. Aerial Photo of Site
3. Photos
4. BEHAVE Fire Spread Models
5. Water District Letter; 8-14-06
6. DPLU Fire Marshal approval; 1-31-07



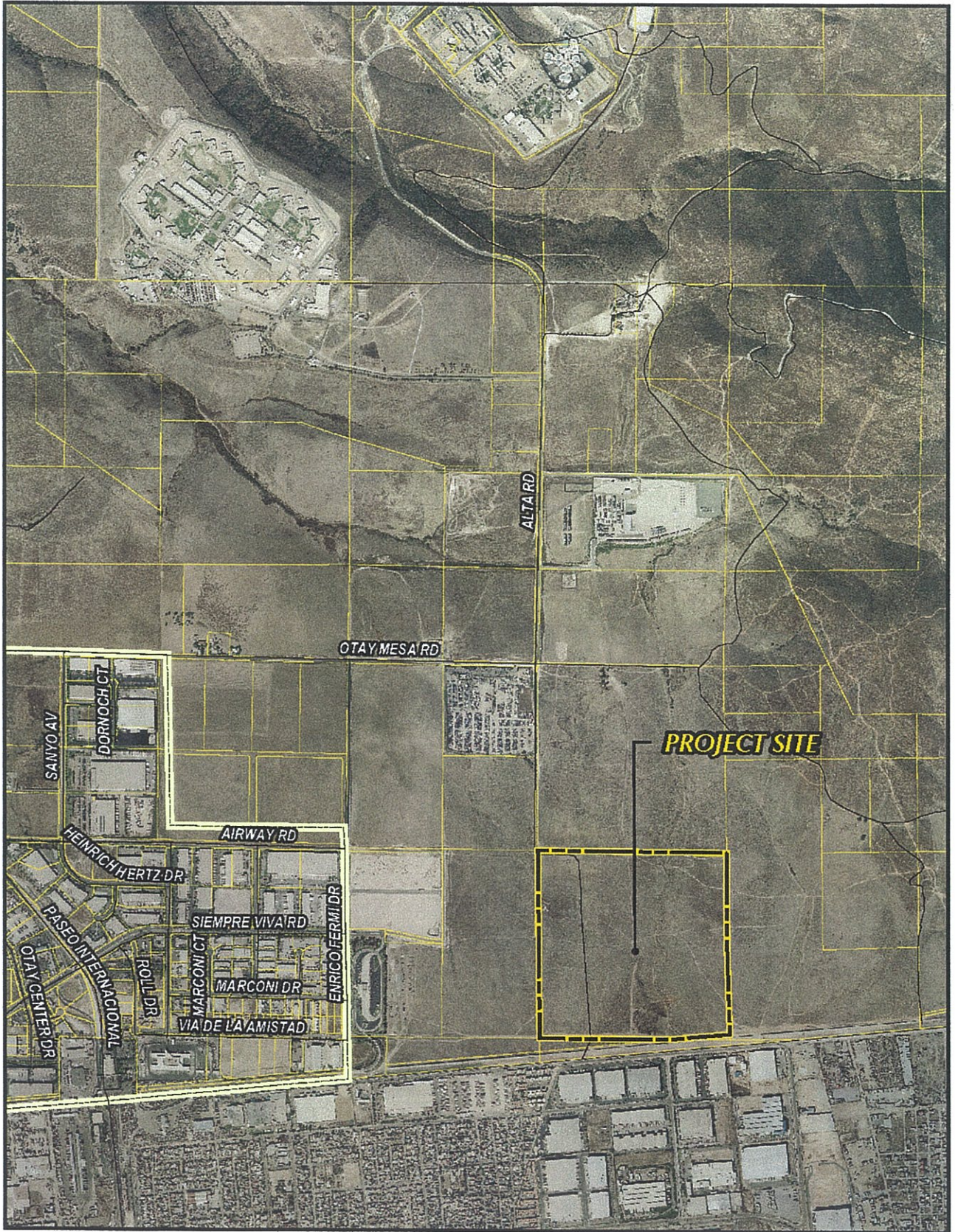
**1. SITE MAP**

11X17 map



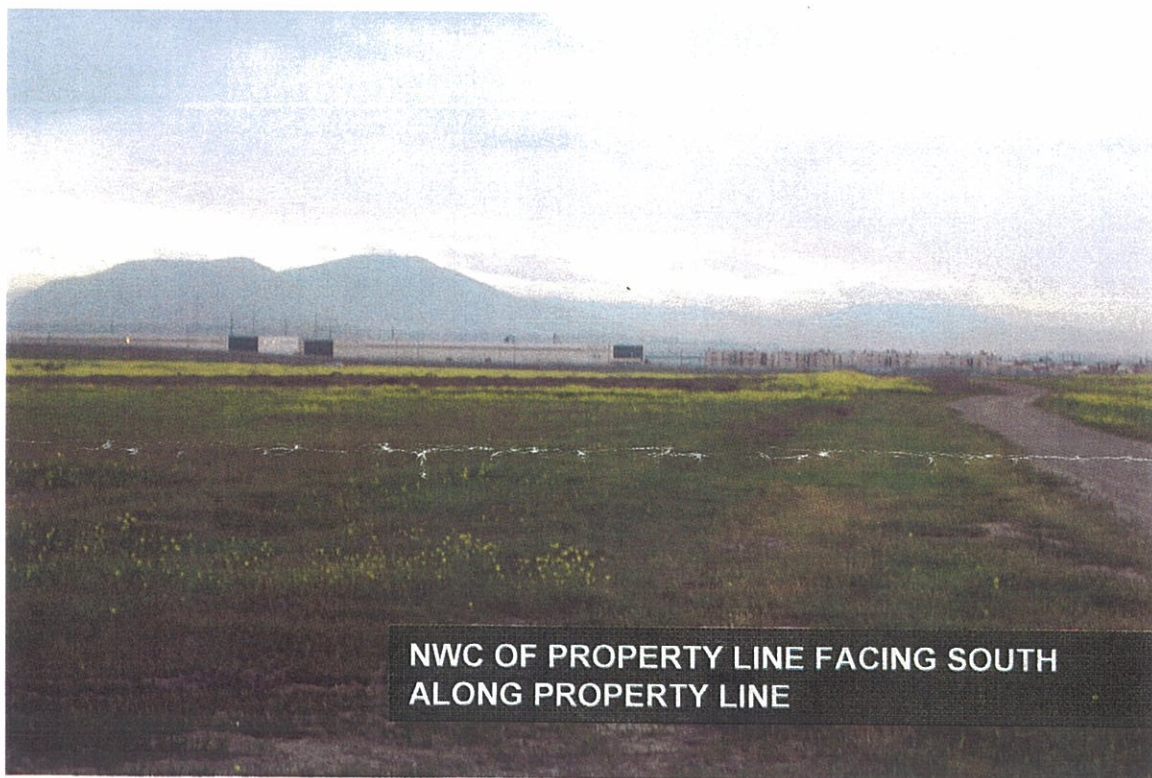
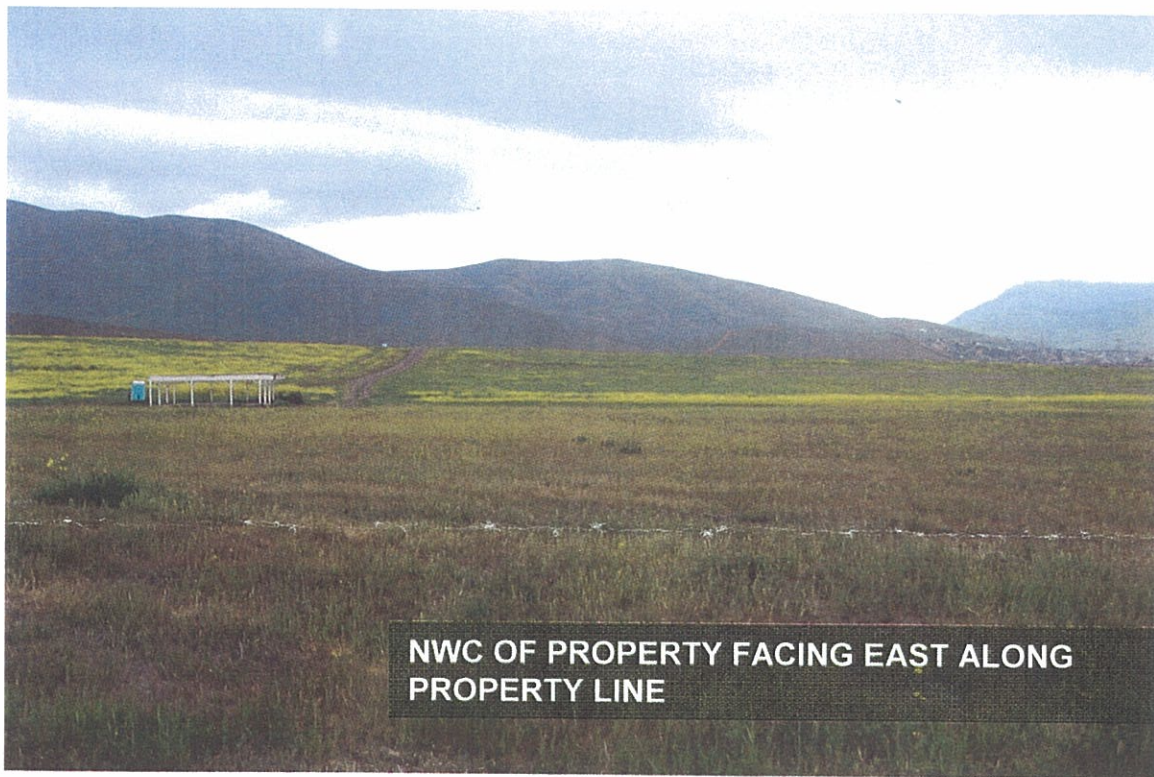
**2. AERIAL PHOTO OF SITE**







**3. OTHER SITE PHOTOS**



## Title: Site Photographs



Kimley-Horn  
and Associates, Inc.

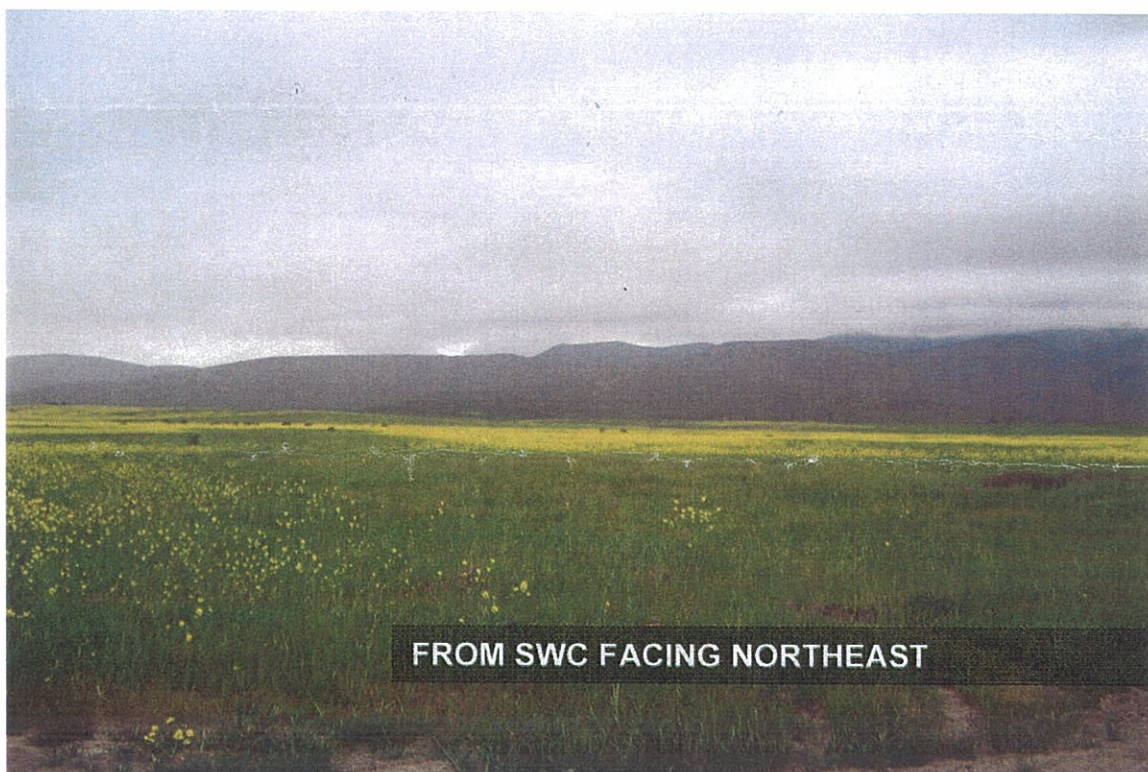
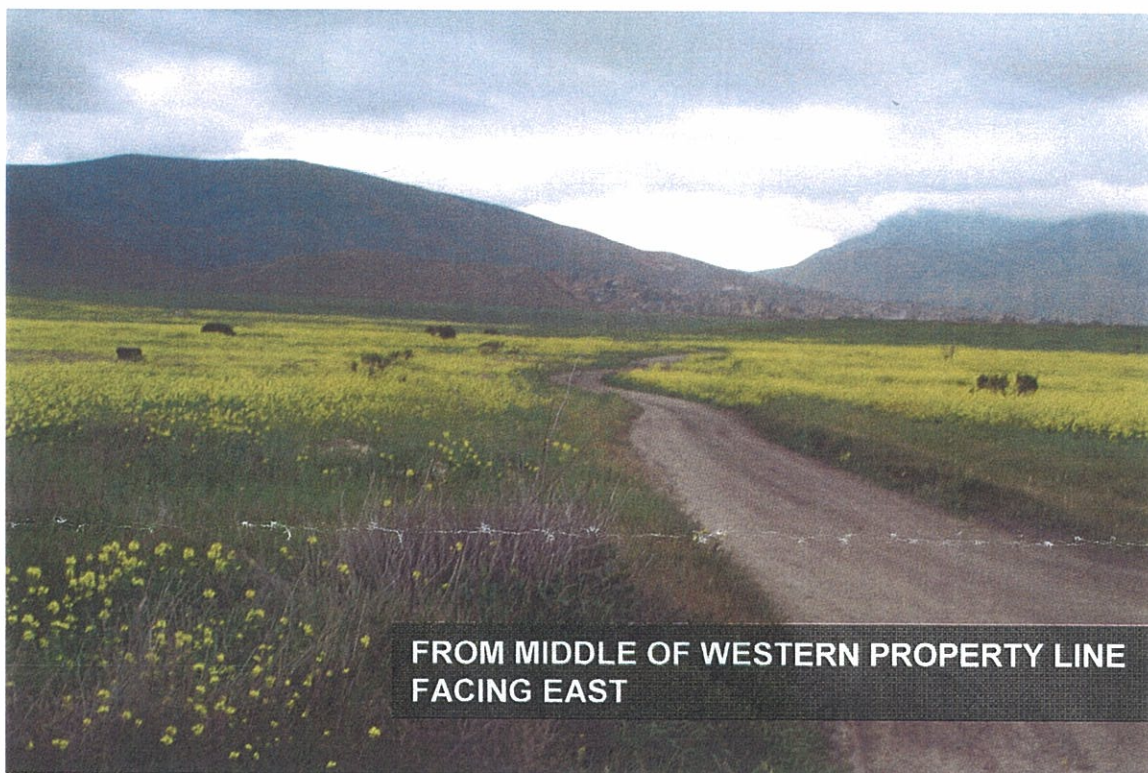
Project: Otay Business Park

Date: June 2006

Project No.  
095529000

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## Title: Site Photographs



Kimley-Horn  
and Associates, Inc.

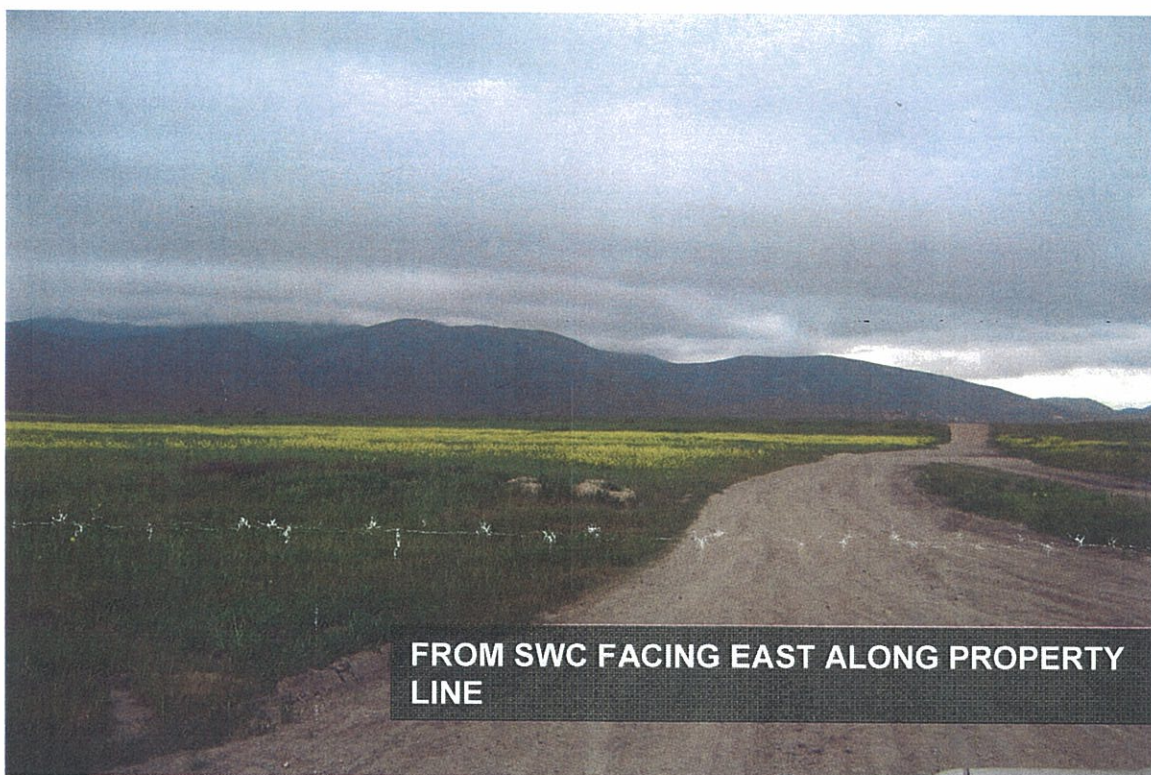
Project: Otay Business Park

Date: June 2006

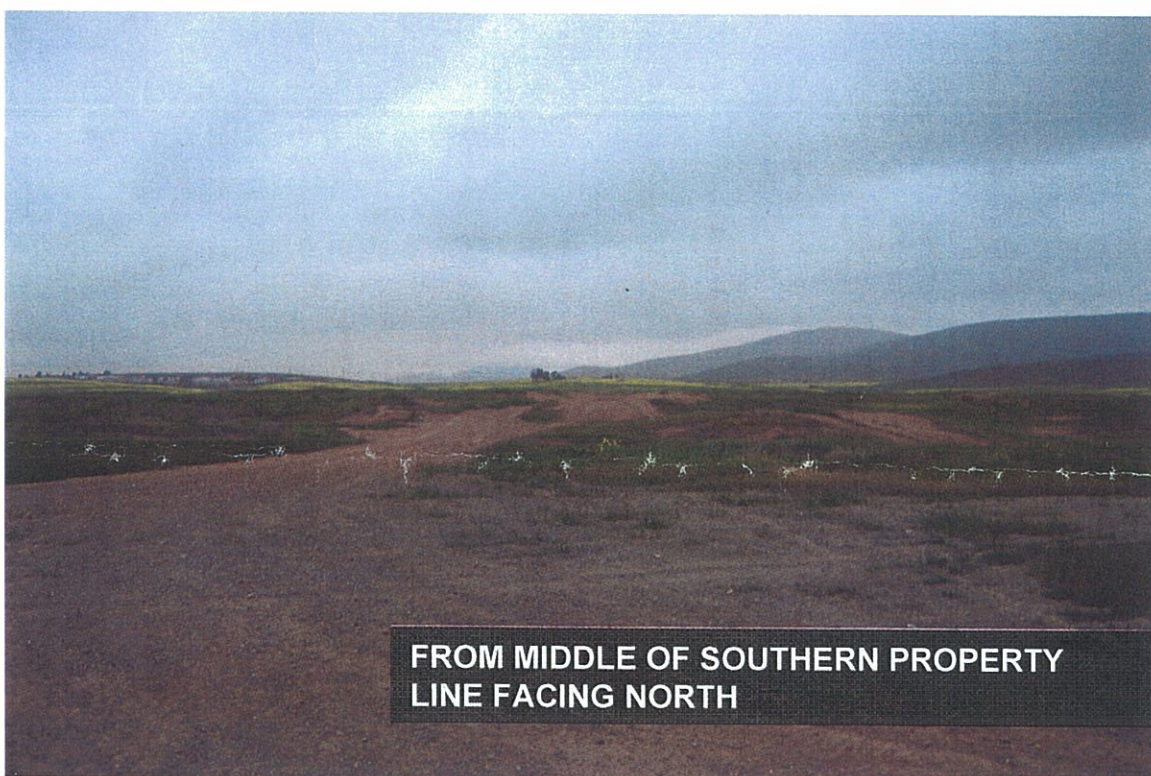
Project No.  
095529000

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**FROM SWC FACING EAST ALONG PROPERTY LINE**



**FROM MIDDLE OF SOUTHERN PROPERTY LINE FACING NORTH**

## Title: Site Photographs



Kimley-Horn  
and Associates, Inc.

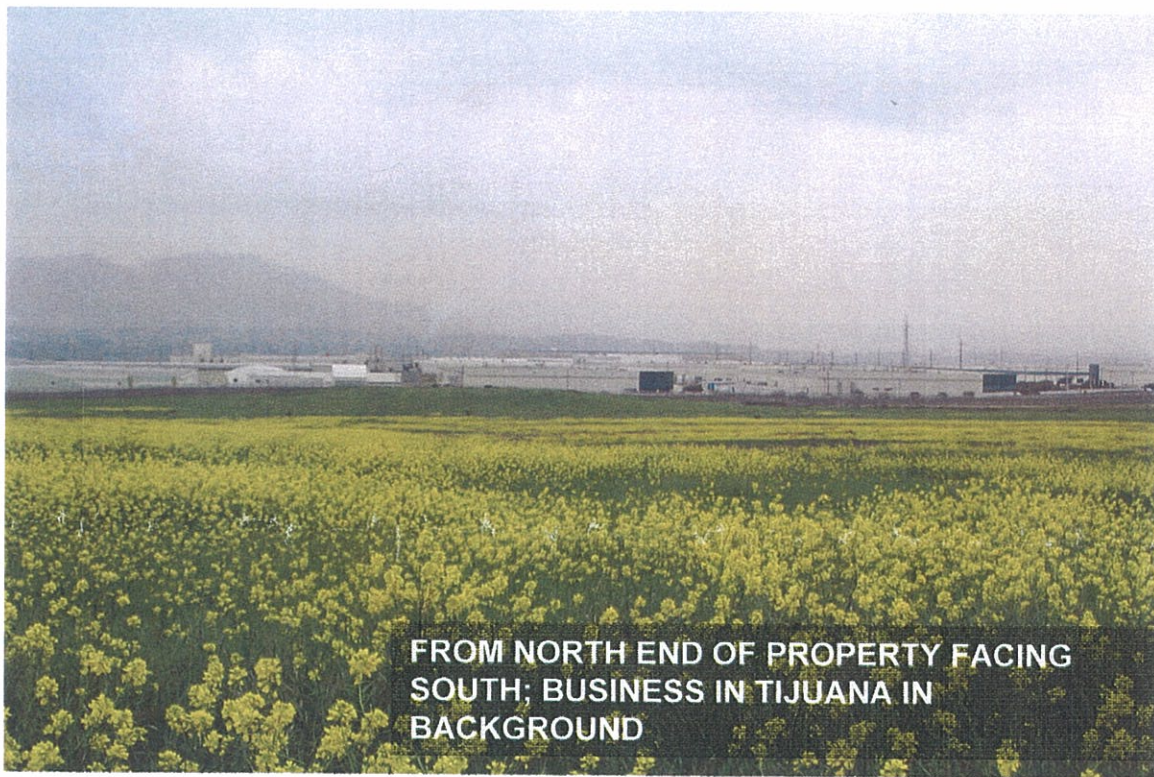
Project: Otay Business Park

Date: June 2006

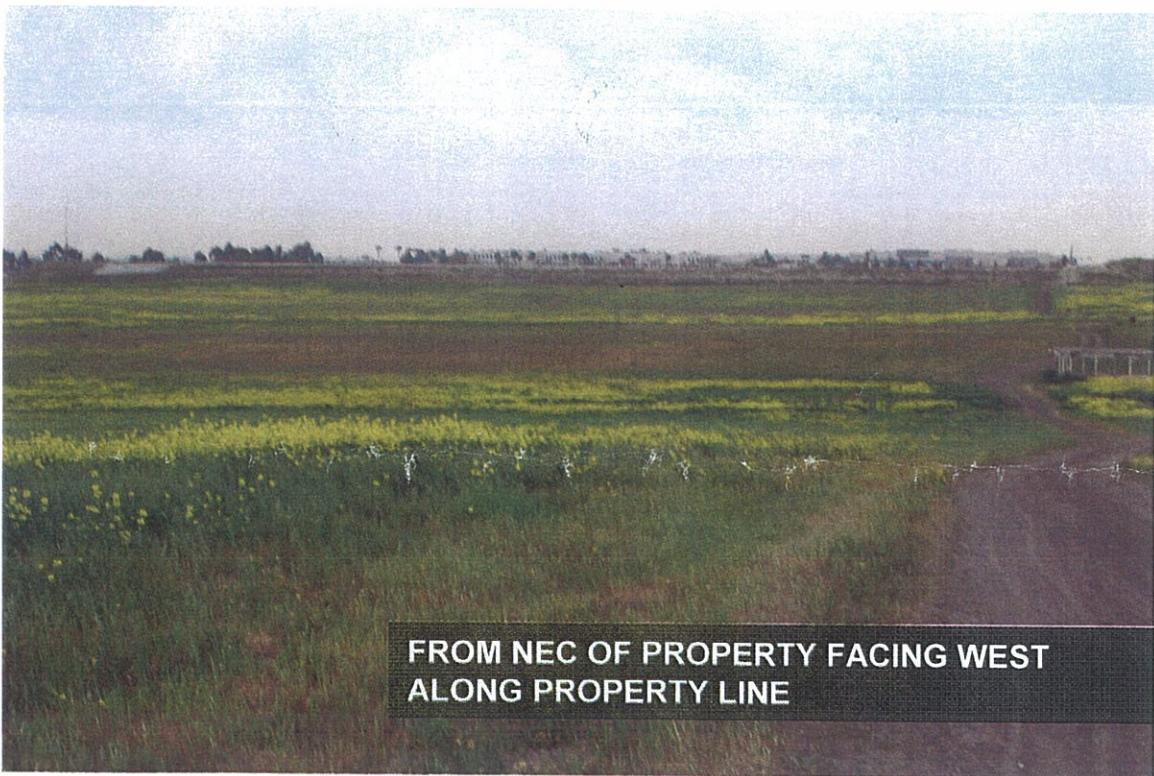
Project No.  
095529000

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FROM NORTH END OF PROPERTY FACING SOUTH; BUSINESS IN TIJUANA IN BACKGROUND



FROM NEC OF PROPERTY FACING WEST ALONG PROPERTY LINE

Title: Site Photographs



Kimley-Horn  
and Associates, Inc.

Project: Otay Business Park

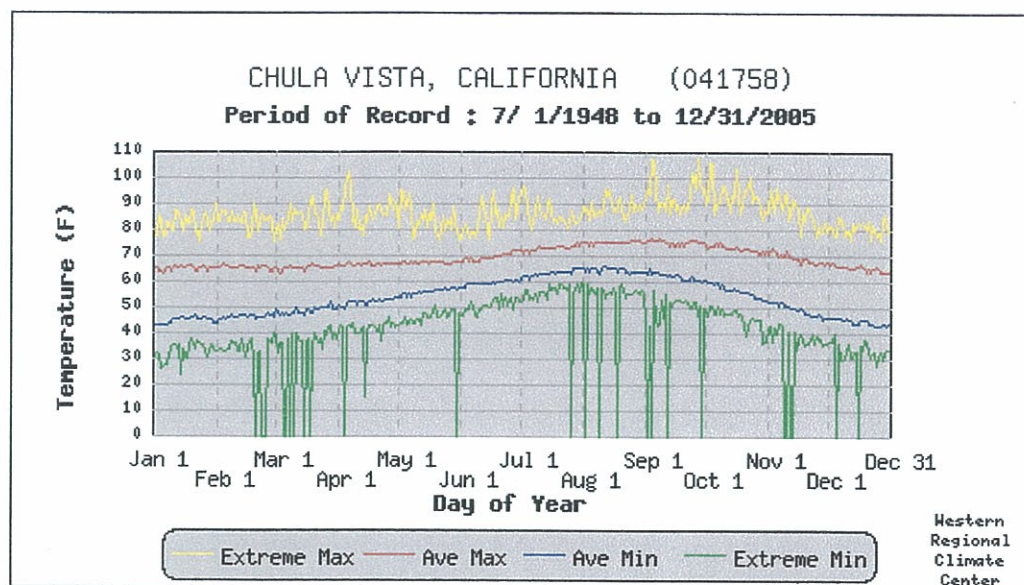
Date: June 2006

Project No.  
095529000

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#### **4. BEHAVE FIRE SPREAD MODELS**







## Modules: SURFACE, SPOT, IGNITE

| Description                          |      | Otay Bus. PK-fallfire |
|--------------------------------------|------|-----------------------|
| Fuel/Vegetation, Surface/Understory  |      |                       |
| Fuel Model                           |      | 3                     |
| Fuel/Vegetation, Overstory           |      |                       |
| Canopy Height                        | ft   | 3                     |
| Fuel Moisture                        |      |                       |
| 1-h Moisture                         | %    | 2                     |
| 10-h Moisture                        | %    |                       |
| 100-h Moisture                       | %    |                       |
| Live Herbaceous Moisture             | %    |                       |
| Live Woody Moisture                  | %    |                       |
| Weather                              |      |                       |
| 20-ft Wind Speed (upslope)           | mi/h | 50                    |
| Wind Adjustment Factor               |      | 0.3                   |
| Air Temperature                      | oF   | 88                    |
| Fuel Shading from the Sun            | %    | 0                     |
| Terrain                              |      |                       |
| Slope Steepness                      | %    | 0                     |
| Ridge-to-Valley Elevation Difference | ft   | 0                     |
| Ridge-to-Valley Horizontal Distance  | mi   |                       |
| Spotting Source Location             |      |                       |

## Run Option Notes

Calculations are only for the direction of maximum spread [SURFACE].

Fireline intensity, flame length, and spread distance are always  
for the direction of the spread calculations [SURFACE].

Wind is blowing upslope [SURFACE].

## Output Variables

Surface Rate of Spread (maximum) (ch/h) [SURFACE]

Flame Length (ft) [SURFACE]

Midflame Wind Speed (upslope) (mi/h) [SURFACE]

Max Eff Wind Exceeded? [SURFACE]

Spot Dist from Wind Driven Surface Fire (mi) [SPOT]  
(continued on next page)



## Otay Bus. PK-fallfire

|  |            |
|--|------------|
| Surface Rate of Spread (maximum)         | 741.4 ch/h |
| Flame Length                             | 35.5 ft    |
| Midflame Wind Speed (upslope)            | 15.0 mi/h  |
| Max Eff Wind Exceeded?                   | No         |
| Spot Dist from Wind Driven Surface Fire  | 2.1 mi     |
| Probability of Ignition from a Firebrand | 100 %      |

## Modules: SURFACE, SPOT, IGNITE

## Description

Otay fall

## Fuel/Vegetation, Surface/Understory

Fuel Model

3

## Fuel/Vegetation, Overstory

Canopy Height

ft

3

## Fuel Moisture

1-h Moisture

%

2

10-h Moisture

%

100-h Moisture

%

Live Herbaceous Moisture

%

Live Woody Moisture

%

## Weather

20-ft Wind Speed (upslope)

mi/h

14

Wind Adjustment Factor

0.3

Air Temperature

oF

88

Fuel Shading from the Sun

%

0

## Terrain

Slope Steepness

%

0

Ridge-to-Valley Elevation Difference

ft

0

Ridge-to-Valley Horizontal Distance

mi

Spotting Source Location

## Run Option Notes

Calculations are only for the direction of maximum spread [SURFACE].

Fireline intensity, flame length, and spread distance are always  
for the direction of the spread calculations [SURFACE].

Wind is blowing upslope [SURFACE].

## Output Variables

Surface Rate of Spread (maximum) (ch/h) [SURFACE]

Flame Length (ft) [SURFACE]

Midflame Wind Speed (upslope) (mi/h) [SURFACE]

Max Eff Wind Exceeded? [SURFACE]

Spot Dist from Wind Driven Surface Fire (mi) [SPOT]  
(continued on next page)





## Otay fall

|  |            |
|--|------------|
| Surface Rate of Spread (maximum)         | 145.4 ch/h |
| Flame Length                             | 16.8 ft    |
| Midflame Wind Speed (upslope)            | 4.2 mi/h   |
| Max Eff Wind Exceeded?                   | No         |
| Spot Dist from Wind Driven Surface Fire  | 0.5 mi     |
| Probability of Ignition from a Firebrand | 100 %      |

*181 mph*

## Modules: SURFACE, SPOT, IGNITE

| Description                          |      | Otay- summerfire |
|--------------------------------------|------|------------------|
| Fuel/Vegetation, Surface/Understory  |      |                  |
| Fuel Model                           |      | 3                |
| Fuel/Vegetation, Overstory           |      |                  |
| Canopy Height                        | ft   | 3                |
| Fuel Moisture                        |      |                  |
| 1-h Moisture                         | %    | 3                |
| 10-h Moisture                        | %    |                  |
| 100-h Moisture                       | %    |                  |
| Live Herbaceous Moisture             | %    |                  |
| Live Woody Moisture                  | %    |                  |
| Weather                              |      |                  |
| 20-ft Wind Speed (upslope)           | mi/h | 20               |
| Wind Adjustment Factor               |      | 0.3              |
| Air Temperature                      | oF   | 95               |
| Fuel Shading from the Sun            | %    | 0                |
| Terrain                              |      |                  |
| Slope Steepness                      | %    | 0                |
| Ridge-to-Valley Elevation Difference | ft   | 0                |
| Ridge-to-Valley Horizontal Distance  | mi   |                  |
| Spotting Source Location             |      |                  |

## Run Option Notes

Calculations are only for the direction of maximum spread [SURFACE].

Fireline intensity, flame length, and spread distance are always for the direction of the spread calculations [SURFACE].

Wind is blowing upslope [SURFACE].

## Output Variables

Surface Rate of Spread (maximum) (ch/h) [SURFACE]

Flame Length (ft) [SURFACE]

Midflame Wind Speed (upslope) (mi/h) [SURFACE]

Max Eff Wind Exceeded? [SURFACE]

Spot Dist from Wind Driven Surface Fire (mi) [SPOT]  
(continued on next page)





## Otay- summerfire

|  |            |
|--|------------|
| Surface Rate of Spread (maximum)         | 201.1 ch/h |
| Flame Length                             | 18.7 ft    |
| Midflame Wind Speed (upslope)            | 6.0 mi/h   |
| Max Eff Wind Exceeded?                   | No         |
| Spot Dist from Wind Driven Surface Fire  | 0.7 mi     |
| Probability of Ignition from a Firebrand | 91 %       |

*25 mph*

**5. WATER DISTRICT FIRE FLOW LETTER**





...Dedicated to Community Service

2554 SWEETWATER SPRINGS BOULEVARD, SPRING VALLEY, CALIFORNIA 91975-2304  
TELEPHONE: 670-2222 AREA CODE 619 [www.otaywater.gov](http://www.otaywater.gov)

August 14, 2006

W.O. P1438-0030000

Activity: 3104

Hunt Research Corporation  
PO Box 291  
Solvang, CA 93464

SUBJECT: Fire flow calculations for Alta Road s/o Otay Mesa Road

To Mr. Jim Hunt,

Fire flow calculations for the subject site were performed by District staff using MWH Soft, Inc., H<sub>2</sub>O map water, Version 6.0, under the following assumptions:

- a. The water level in the storage facility at the time of a fire is at the minimum operational level that typically occurs during peak-hour demand conditions.
- b. The prescribed two-hour fire duration coincides with a maximum day demand condition.
- c. Into and out of the pressure zone where a fire is occurring, all Agency booster pumps are off.
- d. Areas outside the fire circumference in the same pressure zone maintain a minimum pressure of 20 PSI.
- e. Current static pressure based on hydraulic grade line calculations is: 142.6 PSI

The results are as follows:

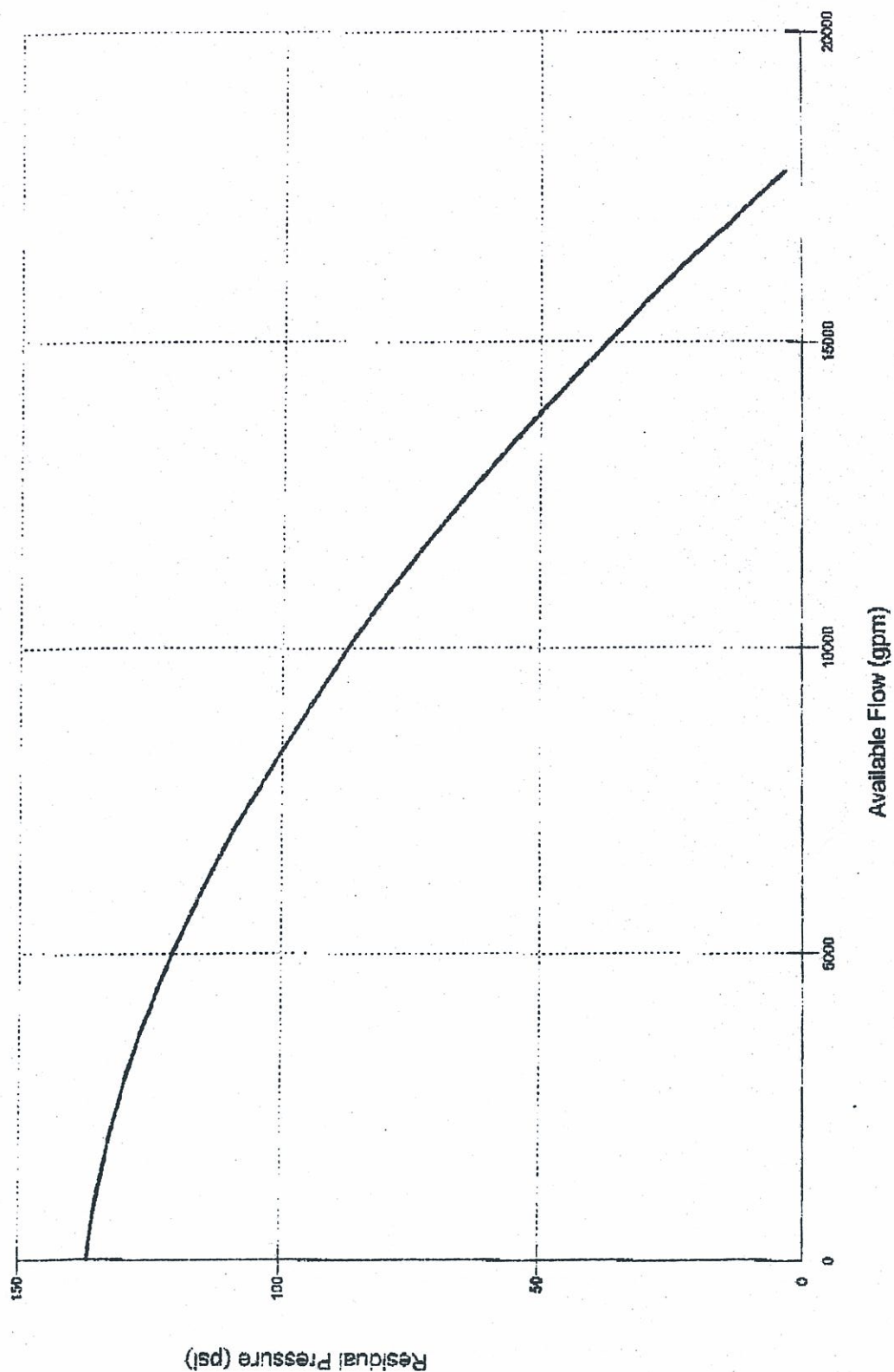
|                    |        |   |
|--------------------|--------|---|
| STATIC PRESSURE:   | 136.4  | PSI (System demand only at maximum day condition)             |
| RESIDUAL PRESSURE: | 130.8  | PSI (System and fire flow demand of 2,500 gallons per minute) |
| FLOW @ 40 PSI:     | 14,556 | GPM   |
| FLOW @ 20 PSI:     | 16,214 | GPM   |

A hydrant system curve is also attached for your reference.

Sincerely,

THE OTAY WATER DISTRICT  
DEVELOPMENT SERVICES

Hydrant Curve for Junction 6123 at 06:00 hrs





**6. DPLU FIRE MARSHAL APPROVAL; 1-31-07**

**ATTACHMENT J**  
**Fire Protection Planning**

San Diego Rural Fire Protection District

The San Diego Rural Fire Protection District has reviewed the fire protection plan submitted by the Hunt Research Corporation. The plan meets the objectives of the California Fire Code 2000 edition, Article 86 "Fire Protection Plan Urban-Wildland Interface (UWI) Areas" as well as the Fire Districts requirements for discretionary projects.

The following are requirements for the above referenced project.

1. All roads associated with this proposed project shall be constructed to current County Road Standards and improved with AC.
2. Proposed roads within this project shall be named with the proper signage being installed at intersections to the satisfaction of the Fire District and DPW.
3. A 100' hazard reduction zone shall be implemented around all proposed structures. The further a 10' fuel reduction zone shall be developed on both sides of any roadway or driveway.
4. Hydrants shall be installed every 350' and be capable of delivering 2500 GPM with a 20 PSI residual.
5. At signalized intersection the developer shall install preemptive traffic devices (Opticom).
6. The developer shall produce a Fire Prevention Plan/Technical Report consistent with Article 86 of the California Fire Code, for Fire District review and approval.
7. The developer shall initiate a LAFCO annexation proceeding as this project resides within the un-incorporated area of the County of San Diego but not within the San Diego Rural Fire Protection District.

Fire Services Section, Department of Planning and Land Use

We have reviewed a Conceptual Fire Protection Plan (FPP) for the subject project, prepared by Hunt Research Corporation dated September, 2006, and have completed review of it for compliance with requirements of California Fire Code Article 86.

The FPP presents a thorough analysis of a *general* proposal. As stated in the FPP, **"focused Fire Protection Plans and submittals will be required for the development on each lot..."**

The FPP includes *"recommendations"* which must be changed to mandatory language in those subsequent FPP submittals.

We have now received Fire Chief Nissen's evaluation of the September 2006 document, dated January 11, 2007, and concur with his acceptance. We find the content as fulfilling requirements of Article 86.